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The Effects of Departures From Prior Return Measures on Individual Taxpayer Frame and Tax Reporting Decisions.

Phyllis V. Copeland

Louisiana State University and Agricultural & Mechanical College

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THE EFFECTS OF DEPARTURES FROM PRIOR RETURN MEASURES
ON INDIVIDUAL
TAXPAYER FRAME AND TAX REPORTING DECISIONS

A Dissertation

Submitted to the Graduate Faculty of the
Louisiana State University and
Agricultural and Mechanical College
in partial fulfillment of the
requirements for the degree of
Doctor of Philosophy

in

The Department of Accounting

by

Phyllis V. Copeland

B.S., University of New Orleans, 1965

M.S., University of New Orleans, 1985

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ABSTRACT

The individual tax compliance gap persists despite costly enforcement efforts that attempt to dissuade noncompliance by identifying noncompliant taxpayers and imposing sanctions on those identified. Enforcement strategies that reduce the psychological incentives of noncompliance may complement the dissuasive approach. The present study probes this psychological alternative by examining several factors that are potential determinants of how taxpayers perceive their tax return results, and accordingly, how much reporting risk they are willing to assume.

Noncompliance is modelled as a two-tier process. The first relies on adaptation level theory that suggests taxpayers frame the filing of their current year tax returns with respect to the tax consequences of prior years' returns. The second relies on prospect theory that suggests taxpayers in loss frames are more risk prone (noncompliant) than those in gain frames.

Sixty-four taxpayers participated in an experiment used to test the noncompliance model. Participant expectations were based on their individual prior tax return liabilities and refund status amounts. The task presented them with current year "estimates" that reflected increased or decreased liabilities with respect to prior amounts and increased or decreased refunds or additional amounts of tax

owed with respect to these prior measures. Subjects rated their satisfaction with the estimates and their inclinations to modify the current returns to include ambiguous deductions.

Results are supportive of both tiers of the model. Increases in tax liability, decreases in refund amounts, and increases in additional tax owed induce loss frames. Changes in the opposite directions induce gain frames. Taxpayers in loss frames are more inclined to include ambiguous deductions than those in gain frames. Cash position, the presumed framing determinant in previous studies, induces gain and loss framing, respectively, when there is a refund due and when additional tax is owed. The effects of frame on risk diminish over time although reported frame intensity does not appear to decline.

Implications for formulating policy that may minimize changes and statuses that induce loss frames are discussed. Suggestions for further research regarding framing and timing are made.

CHAPTER 1
INTRODUCTION AND BACKGROUND

Introduction

The estimated amount of tax revenue lost through noncompliance with the tax laws has tripled in the past ten years and has increased from \$88 billion to \$119 billion over the past five years (Smith et al. 1994). Two-thirds of this deficit is attributed to individual taxpayers (Smith et al. 1994). Noncompliance includes taxpayer filing decisions (including decisions not to file) that are explicitly in violation of tax law. The Internal Revenue Service (IRS) also includes reporting choices that result from taxpayer-favorable interpretations of ambiguous tax law but that differ from the interpretations of the IRS. The former constitutes tax evasion; the latter, tax avoidance. Since both evasive and avoidance filing decisions have a probability of resulting in additional taxpayer payments of unpaid tax, interest, and penalties, they may be categorized as "aggressive" (risky) taxpayer postures. The resilience of aggressive reporting to both legal sanctions and to noncompliance detection efforts, which consume nearly two-thirds of the \$5 billion IRS budget (IRS 1990), is evidenced by the persistence of the compliance gap.

The present study examines taxpayer motivation for noncompliance, to assess the feasibility of implementing

complementary enforcement strategies that may reduce, on average, the motivation to assume aggressive reporting postures. This chapter briefly discusses the traditional tax enforcement mechanism. It develops the alternative approach used in this study. Finally, it presents the research questions.

The Traditional Tax Enforcement Mechanism

Sanctions as Deterrents

Tax enforcement relies on the effectiveness of legal sanctions (economic and punitive penalties) in deterring the assumption of aggressive filing postures. Legal penalties range from small fines to imprisonment terms. Recent years have witnessed stiffened penalties for both taxpayers and tax preparers (Wilde 1988) despite the nonlinear relationship between the severity of a sanction and its deterrence effect. For instance, Tittle (1980), Christiansen (1980), and Friedland (1982) provide evidence of a threshold effect whereby, given a threshold probability of detection, a mild punishment may be as effective a deterrent as a more severe one. Further, sanctions that are perceived as too severe may elicit complete disregard for the law; moonshining during Prohibition illustrates this phenomenon (Jackson and Milliron 1986).

In reviewing 18 studies that have examined the relationship between sanctions and tax compliance (Jackson

and Milliron 1986), sanctions have been found to deter noncompliance in ten of the studies. Only two found an adverse effect of sanctions upon compliance, and the remaining six studies found no effect. Interestingly, two of the studies (Grasmick and Scott 1982, and Schwartz and Orleans 1967) found that the threat of guilt feelings is a stronger deterrent to noncompliance than are legal sanctions. Overall, research results have corroborated the effectiveness of the sanction mechanism in deterring noncompliance. However, it suggests that further increasing the severity of sanctions may result in no improvement in the level of compliance or, at the extreme, give rise to adverse consequences.

Identification of Noncompliers

Enforcement efforts focus on the identification of specific taxpayer types who are likely to assume aggressive reporting stances despite the deterrence structure. For almost two decades the IRS has employed some 64 indexes of noncompliance to expedite the detection of those who file aggressively (IRS 1978). These include socio-economic variables among which, to name a few, are age, gender, education, income, and complexity of return.

Presently, the IRS is expanding its enforcement structure and establishing 31 District Offices of Research and Analysis (DORA's) that will target enforcement efforts at specific taxpaying market segments (Harms 1995). For

example, taxpayers with common sources of income (e.g., self-employment) or similar occupations (e.g., plumbers, carpenters, restaurateurs) may define a market segment. The DORA mission's objective is to study various market segments to identify those that have low compliance rates and then to direct enforcement efforts and taxpayer education programs toward those specific segments. The Service is building a database of filed returns, beginning with the 1992 tax year, to expedite identification of noncompliant segments (Harms 1995). Identification of nonfilers is also on the IRS's agenda. At this time the Service is unsure of the tact these efforts will take since nonfilers elude visibility (Harms 1995).

Research results have partially validated the IRS's indexes of noncompliance, but overall results are mixed. For instance, numerous studies have examined the age variable. Tittle (1980) and Warneryd and Walerud (1982) have found that older taxpayers are more compliant. However, several studies (e.g., Milliron 1985, Spicer and Becker 1980, and Spicer 1974) have found no relationship between age and noncompliance. The findings of Clotfelter (1983) suggest a curvilinear relationship between the two, wherein the youngest and eldest taxpaying segments are more compliant than those in between.

Practically all studies examining the gender variable have found males to be less compliant than females. One

exception is Friedland, Maital, and Rutenburg (1978) that found women less compliant than men. This study, however, used Israeli students as subjects and it is possible that the attitudes of the females in the group were less conservative than their U.S. counterparts. If generational attitudes underlie the gender/noncompliance relationship, as hypothesized by Tittle (1980), it is plausible that the attitudes of both genders are converging as non-traditional women emerge (Grasmick, Finley, and Glaser 1984).

The education variable refers to the taxpayer's technical ability to comprehend and comply with the tax laws (IRS 1976). Westat (1980) found that 35 percent of his taxpayer sample had misconceptions about tax laws, thus suggesting that noncompliance would be a reasonable expectation from this taxpaying segment. Lewis (1982) concurs with the rationale that misconceptions breed noncompliance. However, taxpayers who are well versed in tax law have the where-with-all to recognize and seize noncompliance opportunities. Accordingly, a positive relationship between education and noncompliance has been found by Witte and Woodbury (1985) and by Chang (1984). Thus, it appears uncertain whether highly educated or poorly educated taxpayers are more likely to be noncompliers.

Investigations of the income variable have produced mixed results. Approximately one-half the studies

examining the relationship between income level and compliance have found that high income taxpayers are most compliant and the other one-half have found that low income taxpayers are most compliant. Mason and Lowry (1981) and Witte and Woodbury (1985) complete the spectrum by finding that middle income taxpayers are most compliant. Witte and Woodbury (1985) suggests that the relationship is curvilinear, but Frank and Dekeyser-Meulders (1977) suggests that the confounding variables of income source and occupation account for the mixed findings. These confounding variables are very closely related to opportunity for noncompliance, as is complexity of return, the next factor to be discussed.

Complexity has been argued to aid "playing the tax lottery" (New York State Bar Association 1972), that is, taxpayers' taking the chance that undercompliance will remain undetected and thus result in the payment of lower taxes. It has also been argued to enhance compliance by increasing taxpayer uncertainty (Westat 1980). Research has found complexity a significant variable in noncompliance, but that its directional impact depends upon opportunity for noncompliance (Milliron 1985). Clotfelter (1983) and Witte and Woodbury (1985) have found complexity associated with greater underreporting for nonbusiness tax returns, but not for business tax returns. This finding suggests that business returns provide a sufficient

opportunity for underreporting, whereas complexity is essential to noncompliance opportunity for nonbusiness returns where there is withholding at the income source. Numerous studies (e.g., Slemrod 1985, Witte and Woodbury 1985, and Clotfelter 1983) have found opportunity to be the most important explanatory factor in noncompliance.

There is no strong research support for the IRS's indexes of noncompliance. All of the variables associate at times with noncompliance, and at other times, they do not. The foregoing brief discussions of five of the 64 variables are representative of research results overall and are inconclusive, except perhaps for the related opportunity variable, which appears robust. The IRS's current restructuring efforts are, at least in part, aligned with research results in that certain market segments may have greater opportunity for noncompliance than other segments.

Enforcement Summarized

The progress to date in the tax compliance area has been restricted to the disincentive aspect of noncompliance, that is, to legislating further deterrents (stiffening sanctions) and specifically identifying those who are not dissuaded by impending sanctions. Research results support the use of sanctions (deterrents) and are descriptive of noncompliant taxpayers. Overall, however, the socio-economic profile of the noncompliant taxpayer is

inconclusive. This suggests that the use of socio-economic variables to detect noncompliance introduces considerable error into the identification process.

An Alternative Approach

Underexploited Variables

Research has further examined the role of psychological variables in noncompliance. These include, for example, peer compliance perceptions, deterrence system perceptions, and taxpayer framing. Although perceptual variables have been shown to associate with the degree of compliance, they have found little place in the enforcement process because taxpayer perceptions elude definition and measurement. They are unobservable from filed returns and the determinants of taxpayer perceptions remain unidentified.

Numerous studies (e.g., Collins, Milliron, and Toy 1992, Witte and Woodbury 1985, Geerken and Gove 1975, and Vogel 1974) have consistently found that higher rates of evasion prevail when taxpayers perceive peers as noncompliant. Perhaps when taxpayers believe they have peer approval for assuming aggressive postures they are more inclined to do so. Those who believe peers are compliant are less likely to take reporting risks, perhaps because they do not wish to chance the disapproval of their peers. Thus, perceptions of the standards of others may serve to foster or restrain noncompliance.

Deterrence system perceptions potentially include taxpayers' assessments of two probabilities; these are the probabilities of detection and of the imposition of sanctions. Noncompliant taxpayers perceive a lower chance of detection than compliant taxpayers (Collins, Milliron, and Toy 1992, Mason and Lowry 1981, Tittle 1980, Minor 1978, and Vogel 1974). Taxpayer perceptions regarding the likelihood of the imposition of sanctions have not been found significant except for subjects with precise information about actual probabilities (Spicer and Thomas 1982). These results concur with other studies that have directly compared the relative importances of the two levels and found that the probability of apprehension outweighs the sanctions imposed (Lempert 1982, Erickson and Gibbs 1976, and Tittle and Logan 1973). Thus, deterrence system perceptions appear to influence the extent of tax compliance.

A decision frame is the decision-maker's "conception of the acts, outcomes, and contingencies associated with a particular choice" (Tversky and Kahneman 1981). Accordingly, taxpayers may frame reporting decisions as favorable or unfavorable, or as gains or losses, depending on their overall assessment of the decisions' consequences to themselves. Studies investigating the relationship between taxpayer frame and noncompliance have generally found that taxpayers in loss frames are less compliant than

those in gain frames (e.g., Chang, Nichols, and Schultz 1987, Chang 1984, and Clotfelter 1983). An expanded discussion of framing studies will be presented in Chapter 2.

Rationale

Given that noncompliance occurs when incentives to file aggressively override deterrents (National Academy of Sciences 1989), and that enforcement efforts to date have focused almost exclusively on posing additional and more stringent deterrents, it may be possible to broaden enforcement strategies to reduce the noncompliance incentives. Strategies that reduce noncompliance incentives may effectively complement the current strategies that focus on deterrents. Unrealistic as it may be to expect to influence socio-economic taxpayer attributes that associate with aggressive filing postures, psychological variables may be more susceptible to manipulation. Kinsey's (1984) observation that "noncompliance exists at the intersection of perceived facts and perceived law" suggests that taxpayer perceptions are paramount and enforcement strategies introduced at the perceptual level may be effective. To formulate strategies that exert the desired influence on taxpayer perceptions, it is necessary to isolate the factors in the taxpaying environment that induce the taxpayer perceptions that are conducive to noncompliance. Such factors, once identified,

may then be able to be mitigated or eliminated, thus demotivating aggressive reporting. Reductions in noncompliance motivation could be expected to reduce the aggregate level of risk taking in tax reporting and complement the traditional deterrence mechanism to narrow the overall compliance gap.

Based on the foregoing rationale, the present study is seeking clarification of the relationship between the character (gain or loss) of taxpayer frame and aggressive reporting. Further, it is attempting to isolate contextual factors that characterize taxpayer frame as gain or loss and that may be manipulated to induce frames that are conducive to compliant reporting.

The Research Questions

The first research question that will be addressed is: How does the character (gain or loss) of taxpayer frame affect the level of risk taxpayers assume in making tax reporting decisions? To explore this question the present study relies on prospect theory (Kahneman and Tversky 1979), which will be discussed in Chapter 2. The second research question and the primary thrust of this study is: What variables in the taxpaying context induce the character (gain or loss) of frame that increases tax reporting risk propensity? The theoretical basis for investigating this question will be adaptation level theory (Kahneman and Varey 1989), which also will be discussed in

Chapter 2. Insight into these research questions may enable the formulation of enforcement strategies that manipulate contextual variables so that they induce taxpayer frames of the type that promote risk-aversion and, in turn, a higher level of tax compliance.

CHAPTER 2

REVIEW OF LITERATURE

Introduction

The framing literature is pertinent to the present study. An individual may frame a decision choice as either a gain or a loss, depending on how (favorably or unfavorably, respectively) the decision's consequences are perceived by the individual. Specifically in the case of taxpayers, reporting decision alternatives that are perceived to result in taxpayer-favorable consequences may be framed as gains; those that would impose taxpayer-unfavorable consequences may be framed as losses.

How frame affects taxpayer assessments of expected outcomes and ultimately how these assessments drive choices among risk-variant reporting alternatives is suggested by prospect theory (Kahneman and Tversky 1979). However, studies that have examined the applicability of prospect theory in tax compliance are inconclusive, very likely because the character (gain or loss) of frame has been misspecified. The character of frame depends on whether the individual views an outcome as better (gain) or worse (loss) than some mental benchmark that the individual perceives as his/her neutral condition (norm). This mental benchmark is the individual's framing reference point and it is not necessarily zero. Because taxpayers are diverse, reference

points are likely to differ among taxpayers. Prior studies have presumed identical reference points for all subjects, specifically, zero-refund status. This presumed reference point may often have been erroneous, and frames intended to be of a specific character may have been the opposite. Hence, frames may have been misspecified in prior studies (e.g., Dusenbury 1994, White et al. 1993, Robben et al. 1990, and Schepanski and Kelsey 1990). The use of misspecified frames in the statistical tests of these studies may have precluded consistent validation of the frame/risk relationship predicted by prospect theory.

Also relevant to the present study is the psychological literature that offers some theoretical basis for the selection of the taxpayer reference point. Kahneman and Tversky's (1979) seminal work states that "the past and present context of experience defines an adaptation level, or reference point." Accordingly, adaptation level theory (Kahneman and Varey 1989) will be relied upon in the present study to define the taxpayer reference point and further to test contextual factors for their contributions to this framing benchmark.

This chapter first discusses prospect theory. It then reviews prior studies that have tested prospect theory in a tax context. Third, it discusses adaptation level theory, which may clarify the ambiguities encountered in prior

studies. Finally, this chapter integrates prospect theory and adaptation level theory into the framework of the present research.

Prospect Theory

Prospect theory (Kahneman and Tversky 1979) furnishes a descriptive model of decision-making under risk. It was proposed to explain decision choices that appear to violate the axioms of expected utility (von Neumann and Morgenstern 1947). Prospect theory posits that gambles (prospects) are evaluated subjectively, in contrast to objective valuations of expected payoffs that are the products of the payoff amounts times their probabilities of realization. For instance, a 20 percent chance of winning \$500 and a 50 percent chance of winning \$200 both have expected payoffs of \$100, since $(\$500 \times .20) = (\$200 \times .50) = \$100$. Under prospect theory, the former expected outcome would be evaluated as $(\$500v_1 \times .20p_1)$, and the latter, as $(\$200v_2 \times .50p_2)$, where the v 's are subjective weightings of payoff amounts and the p 's are subjective weightings of their probabilities. Differences between weighting factors used in the two prospect theory computations would result in different valuations of alternatives and would explain why a decision-maker may reveal a preference for one of these alternatives, rather than exhibiting indifference, as should result if expected payoffs were compared.

Prospect theory does not propose an alternative to utility maximization. Instead, it defines utility on gains and losses (*changes* in wealth or welfare) rather than on final asset positions (Kahneman and Tversky 1979). It furnishes an alternative evaluation modification to expected utility theory (Kahneman and Tversky 1979). Rankings of alternatives resulting under subjective valuations would be expected to differ from those determined objectively by a computation of expected payoffs. Thus, if individuals weigh alternatives subjectively, choices would likely differ from those that would be made on the basis of expected payoff comparisons, but yet remain within the purview of utility maximization.

The Value and Weighting Functions

Under prospect theory, the value factor (payoff amount times value weighting) is a function of the individual's psychological frame, which may be categorically defined as either gain (favorable, winning) or loss (unfavorable, losing) with respect to the individual's psychologically neutral reference point. Prospect theory's value function is assymetric over the gain and loss domains. Specifically, it is concave over the gain domain, convex over the loss domain, and steeper for losses than for gains. Compared to expected payoffs which are linear (and thus symmetric), individuals in gain frames would be apt to undervalue

expected payoffs, and in loss frames, to overvalue them. Figure 1 graphically depicts prospect theory's value function on the same set of axes as the expected payoff function; differences in outcome valuations under these two valuation alternatives (subjective versus objective) may be observed and contrasted for the two domains. A comparison of expected payoffs (dashed line) to prospect valuations (solid line) shows that, except for marginal gain states (slightly to the right of the vertical axis which represents neutrality), individuals in gain frames undervalue expected payoffs, and in loss frames, overvalue them. Thus, according to the theory, losses loom larger than gains.

The weighting factor (probability times subjective weighting) is generally lower than the probability of occurrence since subjective weights between zero and one are presumed used by the decision-maker, except for very low or very high probabilities where the relationship is uncertain. Figure 2 depicts a hypothetical weighting function and also the objective probability component of the function. For practically all probabilities, the weighting function (solid line) undercuts the probability function (dashed line). For very small probabilities, the weighting function exceeds the actual probability (crossover of the two plots of Figure 2), and for very large probabilities, the weighting function is

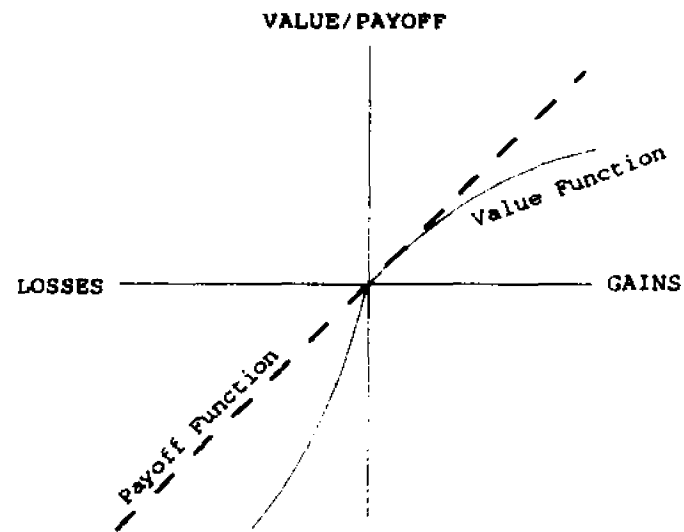


Figure 1
Comparison of Value and Payoff Functions

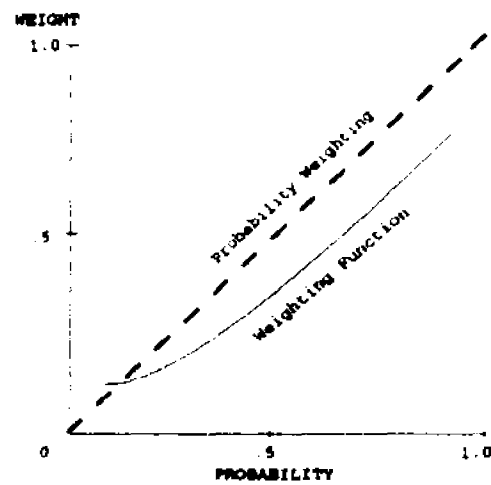


Figure 2
Comparison of Weighting Function and Probability Function

uncertain. Accordingly, the weighting function is not plotted for probabilities approaching 1.0.

The Frame/Risk Relationship

The assymetry of prospect theory's value function across the loss and gain domains (Figure 1) implies that risk reversals are exhibited by individuals in loss frames versus those in gain frames. This phenomenon is termed the reflection effect (Kahneman and Tversky 1979). A comparison of the steeper slope of the function in the loss domain to the more gentle slope in the gain domain reveals that, overall, an incremental unit of loss would be perceived as greater than an incremental unit of gain. Put another way, a loss decrement of x units would be viewed as more valuable than a gain increment of x units. Individuals with an impending loss would be willing to risk more to offset their loss than individuals with an impending gain would be willing to risk to increase their gain by an equivalent amount. Thus, prospect theory's risk prediction is that individuals in loss frames are more risk-prone than individuals in gain frames.

Applicability in Non-tax Areas

Prospect theory has been examined in a number of non-tax choice contexts. These include areas involving direct monetary consequences such as gambling and capital markets investing. Also included are areas involving indirect

monetary consequences, such as participative budgeting, and nonmonetary consequences, such as patient choices of medical alternatives. Although an exhaustive discussion of non-tax studies testing the validity of prospect theory is not entertained here, the following studies provide evidence that the theory's risk predictions have received support in a wide range of contexts.

In repeated gamble experiments, Leopard (1978) found that subjects were more inclined to take risks when they were "behind" than when they were "ahead". This finding supports prospect theory's risk prediction that individuals in loss frames are more risk-prone than individuals in gain frames. Metzger's (1985) field study of horse track betting found that more speculative (risky) bets are placed in later races than earlier ones on any one day. Again this suggests that losers (the expected aggregate condition as the day wears on) are relatively risk prone.

Both Lakonishok and Smidt (1986) and Shefrin and Statman (1985) examined capital markets trades. These studies provide evidence that investors sell winning stocks too early and hold losing stocks too long. Such behaviors reflect the respective risk propensities (aversion and proneness) predicted by prospect theory's value function.

Kim (1992) examined the effect of decision frame, as well as dispositional risk, on the amount of slack built

into participative budget revisions. The introduction of the framing variable extended previous research that had considered only subject-specific dispositional risk (Waller 1988 and Young 1985). Kim (1992) found that participants who were already over-budget (in loss frames) at the time of budgetary revisions incorporated less slack in the revised hours to completion than those who were under-budget (in gain frames). This finding concurs with the prediction of risk-aversion for individuals in gain frames, since the inclusion of slack provides insurance against unforeseen contingencies that may threaten their overall gain status. Losers opted to allow fewer hours for the completion of the task, thereby assuming an even greater risk of finishing over-budget, but taking the long shot at making up for their excess time-to-date when the total task time would be tallied.

Framing studies in a medical context have found that choices among alternative treatments may be influenced by the physician's perspective that is conveyed in the presentation of treatment alternatives. Kahneman and Tversky (1984), McNeil et al. (1982), and Eraker and Sox (1981) found that treatment choices differed depending on how alternatives were verbally presented. For example, when alternatives were framed as gains (in terms of the number of people who would be *saved* by a given therapy), the majority

(72 percent) opted for the certain (riskless) alternative of saving 200 lives rather than the uncertain alternative that had a one-third probability of saving 600 lives and a two-thirds probability of saving no lives. Conversely, when the identical alternatives were framed as losses (in terms of the number of people who would die as a result of a given therapy), 78 percent opted for the risky (second) alternative. Although the end-states were identical under the two framing scenarios, the decided differences in risk propensities that emerged were dependent upon how the alternatives were framed and these risk propensities concurred with the risk predictions of prospect theory.

Prospect Theory and Tax Compliance

The applicability of prospect theory in tax compliance has been examined using archival data and further, empirically via the use of human subjects/taxpayers. Overall, the results are encouraging but inconclusive. This section discusses three archival studies and the primary empirical studies. It concludes with a discussion of the probable weaknesses in these studies that may explain the ambiguous findings.

Archival Studies

The initial evidence that prospect theory may be applicable in tax compliance was provided by archival studies using large IRS databases. Clotfelter (1983) used

the IRS's Taxpayer Compliance Measurement Program (TCMP) to examine the relationship between the voluntary compliance rate (VCR) as assessed by IRS audit and marginal tax rates. Although the research question did not specifically address withholding status at filing time, Clotfelter (1983) reported that taxpayers who owed additional tax payments at upon filing (losers) had lower VCR's than other taxpayers. Thus, it appeared that losers assumed more aggressive filing postures than winners.

Using the 1984 TCMP files, Chang and Schultz (1990) replicated Clotfelter's (1983) findings. This study's specific objective was to test the relationship between withholding status and compliance rate. Although Chang and Schultz (1990) did find that taxpayers who owed additional tax were generally less compliant than those who were due a refund, the study also found an interaction between source of income with withholding position. Chang and Schultz (1990) concluded that other variables, both unobservable and uncontrollable in archival data, may also confound the relationship of interest and conclusive evidence would be obtainable only through experimental studies.

Dusenbury (1992) used data from the IRS's 1985 Tax Modal File to explore the reason why between 75 and 80 percent of all taxpayers prepay more tax than the amount minimally required throughout the year. One hypothesis was

that the widespread withholding mechanism induces a gain frame and thus risk aversion which could explain the overpayments. The link between withholding and frame was based on Thaler's (1985) articulation of prospect theory that each dollar paid at filing time (perceived as a loss) has a larger negative value than each dollar never received because of payroll withholding (net income would still be perceived as a gain). Dusenbury (1992) expected to find that participants in payroll withholding had significantly higher prepayment levels than other taxpayers and that the withholding mechanism may thus account for the excess prepayments. Significance was found for six out of sixteen tests, thus providing some supporting evidence, albeit inconclusive, for prospect theory's risk predictions.

Empirical Studies

Chang et al. (1987) was the first experimental study to examine whether taxpayers are generally risk-averse as predicted by the von Neumann-Morgenstern (1947) axioms. The overwhelming majority of the 56 subjects exhibited risk-aversion. However, when the subjects were partitioned on the basis of whether they viewed tax payments as reductions of gains or as certain losses, those who viewed taxes as losses chose to underreport hypothetical income significantly more often than the others. Thus emerged the first experimental support for prospect theory's frame/risk

relationship. This study, however, offered no insight as to why or how certain taxpayers framed taxpaying as a gain while other taxpayers framed it as a loss. The study was further limited by the unrealistic, hypothetical amounts presented to the sparse number of subjects.

Encouraged by Clotfelter (1983) and Chang et al. (1987), subsequent experimental studies have probed framing and the taxpayer frame/risk relationship. In so doing, these studies have attempted gain and loss frame induction for the subjects. Table 2.1 summarizes selected aspects of the five most recently published experimental studies. Noteworthy is that support for the theory's risk predictions is partial and inconsistent, despite considerable consistency in reference point presumptions and framing techniques across these studies.

Table 2.1
Summary of Experimental Studies

STUDY	RISK/FRAME FINDINGS	REFERENCE POINT	FRAMING
Dusenbury (1994)	Supportive at the \$27,000 income level	Cash Position	Manipulated
Robben et al. (1990)	Supportive only when all studies pooled	Cash Position	Manipulated & Measured
Schadewald (1989)	Supportive only when both studies aggregated	Cash & Accrual Positions	Manipulated
Schepanski & Kelsey (1990)	Supportive only for low detection rates	Cash Position	Manipulated
White et al. (1993)	Supportive only for high detection rates & penalties	Cash Position	Manipulated

Dusenbury (1994) found the expected frame/risk relationship for taxpayers facing a hypothetical income level of about \$27,000, which was held constant for all subjects. The findings, although supportive of the predicted frame/risk relationship, may not be generalizable to other income levels and/or may have resulted by chance. Schadewald (1989) failed to detect the expected relationship in either of two separate experiments but did find it when the two groups were analyzed as an aggregate. Robben et al. (1990) conducted studies in the USA and in five foreign countries. Although the expected frame/risk relationship was not detected in any of the separate studies, this relationship was significant (as predicted by prospect theory) in a pooled analysis of all the studies which, in total, included over 600 subjects. The relationship was found by Schepanski and Kelsey (1990) for low, but not for high, detection rates; by White et al. (1993) for high, but not for low, detection rates, and also for high, but not low, penalty rates.

Among specific studies, supportive results have a randomly occurring flavor. However, they are consistently supportive in the aggregate analyses that increased the size of the sample under scrutiny. This observation suggests that the individual studies lacked the power to detect consistently the relationship of interest. A lack of power

would not likely be attributable to omitted variables (the primary weakness in the archival studies) since the experimental context attempts to control for confounding factors. Therefore, a comparison of the experimental manipulations employed in these studies may suggest commonalities that are potential sources of reduced power.

In four of the studies (Dusenbury 1994, Robben et al. 1990, Schepanski and Kelsey 1990, and White et al. 1993) the only reference point employed to characterize frame as gain or loss was the taxpayer cash position at filing time. Accordingly, tax refunds were presumed to induce gain frames and additional tax payments owed were expected to induce loss frames. The selection and use of the cash position followed the precedent set by the archival studies that were large-sample studies. In the archival studies, any misspecification of this reference point may have been subsumed by the comparatively greater statistical power afforded by their larger sample sizes.

Schadewald (1989) expanded reference point possibilities to include subjects' expected tax liabilities. Under this alternative, unexpected refunds and unexpected additional tax payments owed at filing time were expected to be perceived as gains and losses, respectively. Schadewald's extension contemplated differences in taxpayers' mental orientations. Specifically, taxpayers may

have a "cash" orientation and respond only to cash refunds or additional payments upon filing, or taxpayers may have an "accrual" orientation and respond to unexpected changes in refund status resulting from unexpected changes in tax liability. For example, a taxpayer who expected a tax liability of \$5,000 and a corresponding refund amount of \$500 would perhaps perceive a loss condition if a \$5,300 actual tax liability resulted and, correspondingly, reduced the refund amount to \$200. In contrast, a taxpayer having a "cash" orientation and a zero-refund reference point would perceive the same \$200 refund as a gain condition. Schadewald (1989) examined the frame/risk relationship in separate experiments for these two alternative reference points and did not find significance in either of them alone.

All of the five studies presented hypothetical tax situations to subjects and required them to choose between conservative and aggressive filing alternatives. The presentation to subjects of hypothetical dollar amounts of refunds and additional payments owed were intended to induce gain frames if the taxpayers were to receive a refund and loss frames if the taxpayers owed additional tax. Statistical tests were performed on the basis of the manipulated frames. Only Robben et al. (1990) also tested the frame/risk relationship using subject-reported frames.

These measured frames often differed from manipulated frames and the results of the tests using the measured frames were supportive of prospect theory whereas those using manipulated frames were not.

Frame/Reference Point (Mis)Specification

The primary weaknesses in the foregoing studies and the most plausible explanations for their mixed results are suggested by Kahneman and Tversky (1979) in the statement that prospect value is a function of both (1) the position of the reference point and (2) the magnitude (positive or negative) of the change from that reference point. The reference point has been presumed to be zero-refund status in all the studies except one of Schadeewald's (1989) two experiments. Justification for this break-even reference point originated with the Westat (1980) reasoning that people do not miss what they never have (withheld amounts) but miss much more any extra tax that must be paid when their returns are filed. Thus, refunds resulting from over-withholding would be viewed as gains and additional tax payments resulting from under-withholding would be viewed as losses. The leap from withheld tax to all tax prepayments (such as estimated tax payments) has been based on anecdotal evidence from tax practitioners and taxpayers (Chang and Schultz 1990). Based on such tenuous reasoning, the remaining studies in this area [except part of Schadeewald

(1989) as noted above] have accepted the zero-refund position as the most likely and natural reference point for cash-basis taxpayers.

Kahneman and Tversky's (1979) explanation that the past and present context of experience defines a reference point and Robben et al.'s (1990) discovery that manipulated and measured frames often differed brings into question anecdotal acceptance of the cash position reference point. It is unlikely that all taxpayers recurringly break-even or expect to break-even at filing time. Some taxpayers habitually elect prepayment schemes that assure a tax refund at filing and others pay in the minimum required to avoid an underpayment penalty, practically assuring that additional tax will be owed at filing time. It is therefore reasonable that reference points would differ among taxpayers with diverse prepayment strategy preferences and would differ from zero. Thus, it is likely that the use of cash position as the taxpayer reference point is a misspecification.

Even if the reference point were correctly specified (and with certainty if it were not), subjects' perceptions of the magnitude of the change from the reference point would likely vary under experimental conditions where specific and fixed amounts were used for all subjects. Kahneman and Tversky (1979) further indicate that identical amounts "may imply abject poverty for one person and great

riches for another." Experimental studies presented identical dollar amounts to all subjects in any one treatment group. Given diverse income levels and wealth states among taxpayers, it is unlikely that fixed amounts were equally salient to all subjects (if salient at all) or perceived by all subjects as equivalent departures from the alleged reference point.

Schadewald's (1989) examination of the alternative reference point, taxpayer expectations, may also have been sub-salient. Subjects were told what total tax liability they had expected and what tax liability actually resulted, and again, the amounts were fixed across subjects in the same treatment groups. Although expectations may be a viable alternative to the break-even point, the manner in which this reference point was operationalized may have resulted in non-salience to the subjects and misspecified frames may have resulted.

The types of weaknesses pervading all the literature to date that may explain the mixed results may be summarized as misspecified frames resulting from misspecified reference points and/or the use of dollar amounts that were neither salient to nor perceived equivalent by all subjects. Unless the taxpayer reference point is identified, taxpayer frames can neither be assessed nor manipulated in the tax enforcement process, and the application potential of

prospect theory remains underexploited. In search of a theoretically sound, taxpayer-specific reference point, consideration of taxpaying experience in reference point determination appears essential. Adaptation level theory (Kahneman and Varey 1989), which incorporates the role of prior experiences into the formulation of the "norm" or reference point, affords a theoretical basis for reference point selection.

Adaptation Level Theory

Adaptation contemplates modifications in an organism in response to maintained exposure to environmental changes (Random House 1991). This concept underlies adaptation level theory (Helson 1964), which describes the process with respect to sensory phenomena. Sensory adaptation has been evidenced in response to maintained states, such as to continuous auditory, olfactory, or tactile stimulation (Thompson and Spencer 1966). An individual thus exposed experiences a decreasing response to the state until complete adaptation has occurred. At that point, there is no response; the state has become the individual's "norm," or condition of neutrality. Kahneman and Varey (1989) expanded the purview of adaptation level theory to include perceptual phenomena. Unlike sensory adaptation which is restricted to physical stimuli and biological responses, perceptual adaptation contemplates perceptual stimuli and

psychological responses. Perceptual phenomena are evaluated psychologically, relative to a norm or frame of reference. Analogously to sensory adaptation, repeated exposure to a perceptual phenomenon is postulated to effect a change in the exposed individual's frame of reference, until the phenomenon is perceived as the norm (the individual's revised reference point). An individual's frame of reference is the result of the individual's prior experience and context. Thus, these aspects serve as the individual's relevant benchmarks for assessments of variant experiences and diverse contextual elements.

Figure 3 graphically illustrates the process of adaptation. Given that the individual's initial reference point (neutral response state) is located at point A in Figure 3, successive exposure to a phenomenon at point C causes a directional shift (leftward) of the individual's reference point from its initial position at A. So long as adaptation to the phenomenon is incomplete, the individual's reference point is some point B that lies to the right of C, and the individual perceives the phenomenon as negative, but of decreasing intensity as the reference point moves closer to C. Finally, when adaptation is complete, the revised reference point coincides with C and the individual's perception of the phenomenon is neutral.

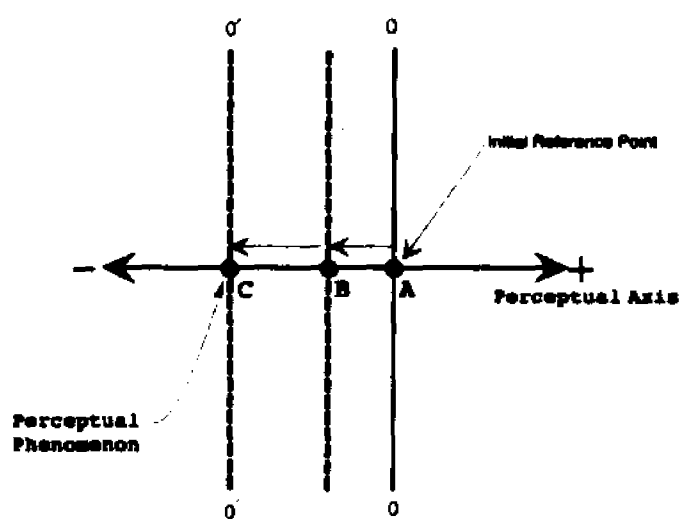


Figure 3
Perceptual Adaptation

The application of perceptual adaptation to tax compliance suggests that taxpayers experience diminished responses to recurring tax payments. Tax return results would be assessed relative to an historical benchmark (frame of reference). Unfavorably perceived outcomes, e.g., refunds (payments) less (greater) than those to which the taxpayer has adapted would be seen as losses. Favorable outcomes, e.g., refunds (payments) greater (less) than those to which the taxpayer has adapted would be seen as gains. Thus, taxpayers would frame variations from prior results as gains or losses.

Independent of adaptation level theory, the alleged importance of prior return measures in tax compliance is reflected in the Tax Panel's (National Academy of Sciences 1989) recommendation that sizable changes from prior return measures be used to signal noncompliance. The Panel's intuitive rationale thus concurs with that suggested by the theory's postulates. The association between departures from prior measures and noncompliance, however, is unvalidated (Long and Swingen 1991). Using IRS data, Long and Swingen (1991) performed a cursory examination of the relationship between the magnitude of the changes from prior return measures and the incidence of noncompliance. Results suggested the reverse, i.e., that larger swings in return measures were associated with greater compliance. This

preliminary finding may be problematic because (1) the direction of departures may not have been considered (this is unspecified in the text), and (2) the amounts examined were extracted from the tax returns as filed. These return measures already included the taxpayers' noncompliant adjustments, and thus were likely to have differed considerably from the unadjusted return measures that were unobservable from the data source.

The Present Research

In general, studies to date investigating the validity of prospect theory's risk predictions in individual tax compliance have jointly tested the location of the anecdotally selected zero-refund reference point and the risk predictions of the theory. Experimental manipulations have further, perhaps, failed to cross the salience thresholds of subjects whose taxpaying levels are variant. Inconsistent results may be the result of reference point misspecification, lack of salience of experimental dollar amounts, the non-applicability of the theory to tax reporting decisions, or some combination of these possibilities.

The present research builds a more comprehensive, theoretical model of the reference point/frame and the frame/risk relationships by integrating adaptation level theory and prospect theory. The model is used to test

hypotheses concerning the contextual determinants of framing and the frame/risk relationship. Alternative reference points are considered and all amounts are based on subject-specific contexts. Finally, it includes a direct test of adaptation level theory.

CHAPTER 3

HYPOTHESES AND METHODOLOGY

Introduction

This chapter discusses theoretical models of taxpayer frame and taxpayer risk attitude. The former is derived from the postulates of adaptation level theory, and the latter conforms to the risk predictions of prospect theory. Both adaptation level theory and prospect theory were discussed in Chapter 2. Independent sets of hypotheses are developed for each model. The integration of the two models through taxpayer frame, their common component, completes the link between the hypothesized contextual variables and the relative levels of risk taxpayers assume in tax reporting decisions.

After developing the hypotheses, this chapter explains the experimental methods and procedures. It outlines the study participation criteria, presents the rationale for imposing these criteria, and describes subject recruitment procedures. Following, it discusses data collection and provides the rationale for obtaining these data. Finally, it presents the primary statistical methods and models used to test the four hypotheses under investigation.

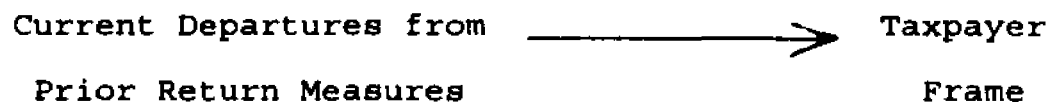
Taxpayer Frame

A Theoretical Model

Adaptation level theory (Kahneman and Varey 1989) suggests that taxpayers, upon learning the preliminary results of their current tax returns, evaluate these results with respect to those they have experienced in prior years (their reference points). They may compare the preliminary results to prior results with respect to total tax liability, refund status, or some other measure(s) or combination of measures. If total tax liability is less than it was previously, the refund due is more, or the amount of additional tax owed is less, then taxpayers would be likely to view the preliminary results as favorable and frame their decisions to file their current returns (as prepared) as gains. Conversely, if the comparative results are in the opposite directions, taxpayers would be likely to perceive the preliminary returns as unfavorable and frame decisions to file the returns (as prepared) as losses. Taxpayer-assessed differences between current tax return results and prior return results would be the relevant framing measures.

Because adaptation level theory is silent with respect to timing, adaptation to prior return results may not precisely coincide with any given set of priors. Still, however, the taxpayer reference point should be some

function of prior experience. Material departures, then, from prior return results should serve as salient framing determinants despite the potential noise introduced by incomplete adaptation. The primary presumption offered by adaptation level theory is that taxpayer frame is a function of current departures from prior return measures. The first of the two tiers of the compliance model of the present study may be represented by the following:



Adaptation level theory further suggests that repeated or prolonged exposure to the current tax return results would initiate a shift in the taxpayer reference point. The shifting reference point would approach the current return results. After some time, differences between the most recent return measures and the (revised) reference point would be perceived to be smaller than they were initially, and the frame induced by the differential would be less intense than the initial frame. Taxpayers who perceived the news of their current results as favorable (unfavorable) would perceive these same results as *less* favorable (*less* unfavorable) at a later time.

Framing Hypotheses

Tax return measures that are likely to be among the most important to taxpayers are total tax liability and refund status. Total tax liability has been suggested by Schadewald (1989) for taxpayers who have an accrual orientation and focus on their total tax liability for a year, regardless of the timing of their tax payments. Refund status has been suggested as the premier return measure by all the experimental studies reviewed in Chapter 2, although zero-refund status rather than prior refund status was defined as the reference point. Total tax liability and refund status, taken together, include in their calculations all taxable income, allowable deductions, the applicable tax rate, and tax prepayments. For most taxpayers these component items probably have the greatest impact on their overall tax consequences for any one year.

If prior tax liability and prior refund status are used as possible taxpayer reference points, the theoretical model of taxpayer frame suggests that current departures from these prior return measures would be expected to affect taxpayer frame, i.e., how taxpayers view the consequences of the current tax return results. Decreases (increases) in tax liabilities, increases (decreases) in refunds due, and decreases (increases) in additional tax payments owed would be perceived as favorable (unfavorable) changes from prior

amounts and would result in gain (loss) framing. Thus, the first two framing hypotheses may be stated, in their alternative forms, as follows:

H_{1a}: Favorable (unfavorable) changes in tax liabilities from prior tax liabilities induce gain (loss) taxpayer framing of the decision to file the current tax return.

H_{2a}: Favorable (unfavorable) changes in refund status amounts from prior refund status amounts induce gain (loss) taxpayer framing of the decision to file the current tax return.

The third framing hypothesis enables a direct test of adaptation theory in the tax context. It is based on adaptation level theory's tenet that the reference point shifts toward the level of the current stimulus with prolonged exposure to that stimulus. This last framing hypothesis may be stated, in the alternative form, as follows:

H_{3a}: The intensity of taxpayer frame diminishes over time.

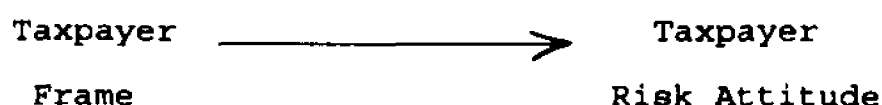
It is expected that, at a later time, taxpayer frames are less intense than they were at the time the taxpayers first became aware of their current tax return results.

Taxpayer Risk Attitude

The Frame/Risk Model

Prospect theory (Kahneman and Tversky 1979) predicts that individuals in loss frames are more risk-prone than those in gain frames. This suggests that, in a tax context,

taxpayer frame affects the level of reporting risk taxpayers are willing to assume. Specifically, taxpayers in loss frames would choose less compliant (riskier) reporting alternatives than taxpayers in gain frames. This second tier of the compliance model of the present study may be represented by the following:



Risk Attitude Hypothesis

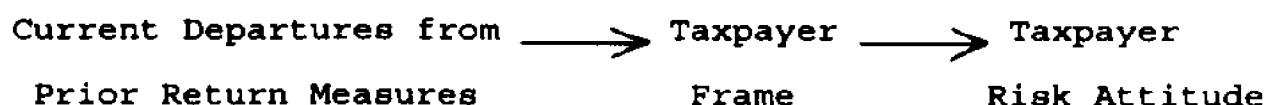
Once taxpayers learn their preliminary (compliant) tax return results, they may file the return as prepared (the safe alternative). Or, taxpayers may search for amounts that may possibly, but not with certainty, be construed as additional deductions or excludable income according to ambiguously phrased tax law. If taxpayers detect such amounts, they then have the option of modifying their preliminary returns accordingly and filing the resulting, riskier versions that afford them the chance of receiving more favorable tax treatment. Recall, such modifications are riskier because taxpayer-favorable interpretations of ambiguous tax law have a probability of IRS disallowance and sanction imposition. Thus, taxpayers may often be confronted with choosing between safe and risky reporting alternatives.

If prospect theory is applicable in a tax context, such as in the foregoing choice scenario, then taxpayer choices between the risk-variant alternatives will be affected by the character of their frames. The risk attitude hypothesis of the present study corresponds to the risk predictions of prospect theory. It may be stated, in the alternative form, as follows:

H_{4a}: Taxpayers in loss frames are more likely to choose risky reporting alternatives than taxpayers in gain frames.

The Integrated Model

The two tiers of the tax compliance model thus far developed in this chapter may be integrated through their common frame component. The integrated model may be represented by the following:



If independent tests of the two tiers of the integrated model provide evidence supporting both sets of hypotheses, then the linkage between observable tax return measures and taxpayer risk attitude is supported. Observable changes in tax return measures may be able to be used to identify potentially noncompliant taxpayers, thus bypassing the unobservable psychological nexus (taxpayer frame). The

present study is the first to attempt to establish this psychological link between changes in return measures and noncompliance.

Subject Recruitment

Taxpayers were recruited through classes held during the 1995 Summer session at the University of New Orleans. Because the second questionnaire's construction was based on pre-experimental information and a repeated trial was necessary to test for adaptation over time, the study was time-sensitive and required three experimental sessions beyond the recruiting session. Thus, regularly scheduled classes, rather than other places where taxpayers convene, were used to minimize attrition over the study period. In order to maintain realism for the subjects and thereby enhance the quality of the data, subject selection criteria and recruitment procedures were designed to obtain voluntary participants who actually had the taxpaying latitude to choose between alternative reporting decisions.

Participation Criteria

To be eligible to participate in the study prospective subjects were required to (1) have filed U.S. tax returns for the 1992, 1993 and 1994 tax years, (2) have an active Schedule A, Schedule C, or Schedule E, (3) be willing to furnish blind copies of pages one and two of their Forms 1040 as filed for the three most recently ended tax years,

and (4) be willing to complete three short questionnaires at one-week intervals following the initial recruitment session.

The "three-year filing" criterion (the first stated above) was expected to filter out inexperienced taxpayers who would have had greater difficulty understanding and relating to the task. It was necessarily imposed to assure there would be a sufficiency of prior tax return data upon which to base taxpayer reference points. The "active schedule" criterion (the second stated above) was expected to assure that participants had actual opportunities to deduct or not deduct ambiguous items and thus would have viewed as realistic and salient the decisions presented in the task. The two remaining criteria were imposed to collect the required data.

Recruitment Procedure

Sixty-four subjects were recruited from evening classes, graduate or professional programs, and non-credit Saturday classes. These prospective subject pools were deemed to be comprised of older, more experienced, employed taxpayers who would be more likely to meet participation criteria than typical undergraduate students. Recruiting generally consumed about five minutes of class time. Instructor permission to recruit during class had been obtained in advance. Prospective subjects were told that

upon completion of the experiment, they would receive \$10 and a complimentary tax consultation if they so desired. Volunteers selected a five-character identification code that was subsequently used to identify their respective data. The remaining three sessions were held before or after scheduled class meetings at one-week intervals and lasted five to ten minutes each.

Data Collection

Data were collected over the three-week period following the recruiting session. Three questionnaires were administered at one-week intervals. Data may be classified as pre-experimental, experimental, and post-experimental. Pre-experimental data was comprised of the participants' tax returns for the three prior tax years and their responses to the first questionnaire that obtained their anticipated 1995 changes in taxable income (with respect to 1994). The first session following the recruiting session was used to collect these data and to obtain expectations of 1995 tax liability and refund status from the holdout sample. Experimental data is comprised of subjects' reactions (their frames) to hypothetical 1995 estimates presented to them and their inclinations (their risk propensities) to include ambiguous deductions that would "improve" the estimates presented. The session following pre-experimental data collection was used to present to participants their 1995 "estimates" for

the first time and obtain initial measures of frame and risk attitude. The last session was a repeated trial and was also used to obtain additional subject information (the post-experimental data).

Pre-experimental Data

At the second meeting, subjects furnished blind copies of pages one and two of their Forms 1040 for 1992, 1993, and 1994, identified only by their participant codes. These six pages contained the amounts of interest, i.e., tax liability and refund status, for the three prior tax years. Entire pages, rather than only the two measures of interest, were collected so as not to sensitize the taxpayers to the pertinent amounts. Only Form 1040 was collected because requiring all schedules would have been likely to discourage participation. The required pages also indicated which schedules had been included with the full returns so that subject-specific scenarios concerning hypothetical, ambiguous deductions could be presented to each participant at the following session.

At that same meeting, all subjects completed the first questionnaire that is presented as the first two pages of Appendix A. This first questionnaire described the experimental context as a study of taxpayer reactions to proposed tax legislation. Since numerous law changes were currently pending in Congress and receiving considerable

attention by the news media, participants would be likely to believe that the hypothetical tax return estimates presented to them at subsequent meetings reflected their 1995 tax consequences under selected, proposed provisions. The information requested by the questionnaire was actually collected in order to determine the influence, if any, that anticipated changes in taxable income exert on taxpayers' reference points. Participants, however, were told that their 1995 expectations were being obtained to improve the accuracy of the ensuing estimates.

Twenty subjects, randomly chosen from across a variety participating classes, also completed the third page of Appendix A at the second meeting. These additional data were the 1995 expected tax liabilities and refund status amounts of this subsample of participants. These expectations were used to derive the final pre-experimental data, the experimental reference points for the framing manipulations.

Experimental reference points were modelled independently for tax liability and refund status. The following procedures were performed using 19 of the 20 observations; one extreme outlier was deleted for each of the two models under construction. First, the 1995 expectations obtained for the holdout sample (Appendix A, page 2) were regressed (stepwise) on the prior three years'

corresponding return measures and on the 1995 estimated changes gleaned from page one of Appendix A. The 1995 estimated change in tax liability used in modelling the liability reference point was calculated as the product of the net estimated change in taxable income (from Appendix A, page 1) times the subject's marginal tax rate (obtained by inspection of the 1994 tax return). The 1995 estimated change in refund status used to model the refund status reference point was assumed to equal the 1995 estimated change in tax liability attributable to anticipated income changes that would not be subject to source withholding (evident from Appendix A, page 1). Both regression results showed a high level of significance ($p = .0001$) for the 1994 tax return measure. The 1995 estimated changes were marginally significant ($p = .0581$) and also included (besides the highly significant 1994 actuals) in the resulting stepwise model of refund status only. No other independent variables reached significance at $p = .15$ in either model.

Next, the 1993 tax return measures were regressed by Ordinary Least Squares on the 1994 measures to isolate any unique information contained in the 1993 measures that was not captured by the 1994 measures. The residual (the unique 1993 information) failed to reach significance at the .10 level in either model. Nevertheless, residuals were not

omitted from the final models because episodes (tax return filings) prior to the most recent (the 1994 filing) had been found to influence reference points (Varey and Kahneman 1992).

Finally, both sets of expectations were regressed using Ordinary Least Squares on the corresponding 1994 measures that had been highly significant, the corresponding 1995 estimated changes in return measures that had been marginally significant (although only for refund status), and the 1993 residuals that are theoretically significant. Again, only the 1994 measures were significant ($p = .0001$) in both regressions. Thus, for experimental manipulation purposes, subject reference points for tax liability and refund status were predicted using the intercepts and the coefficients of the 1994 measures that resulted from this third and final set of regressions. The remaining factors were dropped from the prediction equation. The models used to estimate each participant's experimental reference points (their 1995 expectations based on prior amounts) were as follows:

Tax liability reference point = $455.761114 + 1.055136L$,
where L is the subject's 1994 total tax liability.

Refund status reference point = $56.591744 + .855420R$,
where R is the subject's 1994 refund (additionally owed) amount.

Framing Data - Trial One

The first measure of taxpayer frame was obtained at the third meeting by the first item of the questionnaire that is presented as Appendix B. Since this questionnaire also collected the first measure of taxpayer risk attitude, the order of the questions were reversed to position the framing inquiry after the risk questions for about one-half the subjects. By so doing, it would be verifiable that there was no order effect influencing either subject-reported measure. Participants were required to assess, on a scale of one to seven, their (dis)satisfaction with hypothetical 1995 estimates of tax liability and refund status that were presented to them on the previous page (page one of Appendix B). Ratings below four (neutral reaction) represented loss frames, and ratings above four represented gain frames. The numerical rating was the measure of frame intensity. The procedures that were used to determine the hypothetical 1995 estimates presented to participants on the first page of the questionnaire are described in the following paragraphs.

Subjects were randomly assigned to one of four treatment groups. The four groups were designated as "gain-gain," "loss-loss," "gain-loss" and "loss-gain," according to the frames that were expected to result from the respective liability and refund status estimates presented to the group members. The presentation to a subject of a

tax liability that was greater (less) than that subject's experimental reference point was expected to induce a loss (gain) frame. Estimated refund amounts (additional tax owed) that were less (greater) than the subjects' respective reference points were expected to induce loss frames; estimates differing from refund status reference points in the opposite directions were expected to induce gain frames. Thus, subjects in the "gain-gain" group were expected to report gain frames and those in the "loss-loss" group, loss frames. For the two groups with crossed manipulations, i.e., the "gain-loss" and "loss-gain" groups, induced frames were not predictable. These groups were included to obtain insight into the relative contributions to framing afforded by changes in the two measures. Table 3.1 summarizes the treatments applied to the four groups. It includes the rules according to which the hypothetical estimates of 1995 tax liabilities and refund status amounts were calculated.

Hypothetical tax liability estimates were expected to induce gain (loss) frames when they were 30 percent less (greater) than the subjects' tax liability reference points. The selection of this percentage was somewhat arbitrary and based on anecdotal evidence adjusted for a margin of tolerance. Given that the Economic Recovery Tax Act of 1981 decreased the top marginal tax rate by 20 percentage points, and that this piece of legislation is still credited with

Table 3.1
Group Treatments

<u>Group</u>	Tax Liability	Refund Status
	Manipulated	Manipulated
	<u>to Induce</u>	<u>to Induce</u>
1	gain	gain
2	loss	loss
3	gain	loss
4	loss	gain

Manipulation Rules for Hypothetical Estimates

Liability - gain: $.70 * \text{liability reference point}$

Liability - loss: $1.30 * \text{liability reference point}$

Refund Status - gain: $2 * \text{refund status reference point}$
when refund due;

$1/2 * \text{refund status reference point}$
when additional tax owed

Refund Status - loss: $1/2 * \text{refund status reference point}$
when refund due;

$2 * \text{refund status reference point}$
when additional tax owed

effecting the largest tax cut in the history of the income tax (Smith et al. 1994), it is reasonable that a 20 percent change in tax liability is viewed as material by taxpayers. Because the experimental reference points developed in this study are not without error, and because some fluctuation in tax liability is expected across tax years (even without sizable changes in income or deductions), an additional ten percentage points were added, thus setting the liability manipulation at a 30 percent change level. The use of a 30 percent change in subject-specific liability represents some degree of refinement over prior studies that used not only arbitrary, but also constant, amounts across subjects.

If the refund status reference point was a refund due, a gain frame was expected when the reference point was doubled, and a loss frame when it was halved. If the refund status reference point represented additional tax owed, a gain frame was expected when the reference point was halved, and a loss frame when it was doubled. Refund status was manipulated by a larger percentage change than tax liability because refund status dollar amounts are generally small compared to total tax liabilities and changes that are extremely small in absolute dollar amounts would probably fail to cross taxpayer salience thresholds. The selection of a factor of two was arbitrary. However, a manipulation

check that will be discussed in Chapter 4 provides evidence that the use of this factor was effective.

Risk Attitude Data - Trial One

The first measures of risk attitude were also obtained at the third meeting by the second and third items on page two of the second questionnaire (Appendix B). Subjects were told that proposed changes in tax law were unclear in certain areas (e.g., itemized deductions, business deductions, rental property deductions) and that the wording could be interpreted to allow additional deductions that had not been deducted in arriving at the 1995 estimates presented on the previous page of the questionnaire. The specified areas of such ambiguous deductions were those for which the individual subjects had active schedules.

Subjects were told that the deductions, if taken, would have a 50 percent chance of disallowance that would trigger interest and penalties amounting to 50 percent of the underpaid tax in addition to the underpaid tax. A disallowance rate of .5 was used because both White et al. (1993) and Dusenbury (1994) had found that prospect theory's frame/risk relationship was most pronounced at the 50 percent detection level. If the deductions were allowed to stand, then the taxpayers would reduce their taxes by specified percentages. Subjects were required to rate, on a scale of one to seven, their inclinations to take the

additional deductions under tax reduction outcomes of both five percent (low level) and 20 percent (high level). These ratings were subsequently used to test the risk attitude hypothesis.

Repeated Measures

At the fourth and final meeting repeated measures of framing and risk attitudes were obtained by the third questionnaire that is presented as Appendix C. In order to make plausible the re-presentation of the identical estimates that were initially given the subjects at the previous meeting, the previous questionnaire (Appendix B) had stated that there was an uncertainty that might affect the estimates and additional confirmation was needed to firm up the estimates. On the previous questionnaire subjects had also been afforded the opportunity to furnish any additional information they might have had that could affect their 1995 tax consequences (page one of Appendix B). Thus, the presentation of final estimates at the fourth meeting was expected by the participants and the fact that these estimates remained unchanged should have been credible.

Subjects were again given their 1995 estimates of tax liabilities and refund status amounts. Again they were required to rate, on a scale of one to seven, their reactions (frames) and their inclinations to take the additional deductions (risk attitudes). Re-presentation of

the estimates and the rating questions appear on the first page of the third questionnaire (Appendix C) that was administered at the final meeting.

Post-experimental Data

Post-experimental data were also obtained at the fourth meeting by the remainder of the repeated measures questionnaire (Appendix C). Among these data were participants expectations of their 1995 tax liabilities and refund status amounts, whether their tax returns were self-prepared, true/false responses to a series of questions to assess subject-specific risk propensities, subjects' attitudes toward taxpaying, their familiarity with tax law, and demographic information. The reasons for obtaining the post-experimental data are explained in the following paragraphs.

Expectations were obtained to perform a validation check on reference point modelling. The first 20 (item seven, parts a through t) of the true/false questions were taken with permission from the revised Jackson Personality Inventory (Jackson 1994). Specifically, they are the questions that instrument uses to assess the personality risk trait (in terms of a population percentile). Subject-specific risk propensity was considered a necessary control variable for testing the risk attitude hypothesis because Kim (1992) found that inter-subject risk differences, in

addition to frame, significantly influenced subjects' budgeting choices under conditions of uncertainty. One of the remaining items (item eight of Appendix C) corresponded to the general gamble question used by Kim (1992) to measure subject-specific risk propensity. The remainder of the information was gathered to perform additional tests of competing hypotheses.

The final page of the questionnaire was included to remind participants that all dollar amounts discussed in the experiment were hypothetical and were not reliable amounts for their 1995 tax returns. Their signatures, indicating that they understood the hypothetical nature of the amounts, were obtained on this sheet to release all parties associated with the design and conduct of the experiment from any liability related to the rendering of misleading or fraudulent tax advice.

Upon completion of the last questionnaire, all subjects were thanked for participating and were paid the ten dollar participation fee. Several subjects asked personal tax questions that were answered immediately. Three subjects requested a private tax consultation at another time and place.

Tests of Hypotheses

The following subsections present the primary tests of the framing and risk attitude hypotheses. The respective

statistical methods employed were analysis of variance and regression analysis. The independent and dependent variables included in the models are described for each of the tests.

Framing Hypotheses

Analysis of variance was used to test jointly the three framing hypotheses. The independent variables were (1) change in experimental (estimated) tax liability from the liability reference point, (2) change in experimental (estimated) refund status amount from the refund status reference point, and (3) time. The dependent variable was the subject-assessed reaction (frame) to the experimental estimates presented. Both change in liability and change in refund status were between-subjects factors and were independently characterized as either favorable (when a lesser liability, a greater refund, or a lesser amount of additional tax owed had been presented) or unfavorable (when a greater liability, a lesser refund, or a greater amount of additional tax owed had been presented), corresponding to the manipulations that had been applied to the treatment groups to which the subjects had been assigned. Time was the repeated measures or within-subjects factor. Main effects were expected to be significant for each of the three independent factors.

Risk Attitude Hypothesis

Regression analysis was used to test the frame/risk hypothesis. The independent variables were (1) the subject's reaction (the dependent measure of frame in the framing tests) and (2) the subject's individual risk propensity determined from responses to the final questionnaire. The dependent variable was the subject-assessed inclination to take the ambiguous deductions. Significance was expected for each of the independent variables.

CHAPTER 4

ANALYSIS AND RESULTS

Introduction

This chapter describes the analytical procedures employed in this study and discusses the results obtained. First, it includes a preliminary inspection and examination of the data collected to assure that any bias introduced by procedural aspects of the study did not affect the validity of the hypothesis tests. It presents the tests of the framing and risk attitude hypotheses as well as tests of competing hypotheses. Finally, it includes an analysis directly relating the framing components to risk attitude, bypassing the frame linkage between the two.

Preliminary Inspection and Examination of Data

The 64 subjects who participated in the experiment were diverse with respect to a number of characteristics. These include age, income level, and occupational area, to name a few. Subject demographics are summarized in Table 4.1. From this summary it appears that the participants were not "average" taxpayers. Their relatively high educational level was the result of recruitment through university enrollment. Their higher-than-average income level probably resulted, at least in part, from the participation criterion requiring a Form 1040, Schedule A, C, or E. The atypical characteristics of the sample, however, suggest that these individuals were drawn from the real population of interest,

Table 4.1
Subject Demographics

<u>Characteristic</u>	<u>Percent of Sample</u>
Age (Years)	
Under 25	7.8
25-34	42.1
35-44	21.9
45-54	18.8
55 and Over	9.4
Gender	
Male	40.6
Female	59.4
Educational Level	
High School	34.4
Baccalaureate	29.7
Masters	28.1
Doctorate	7.8
Adjusted Gross Income (1994)	
Under \$25,000	23.5
\$25,000 but less than \$50,000	35.9
\$50,000 but less than \$100,000	32.8
\$100,000 and Over	7.8
Occupational Area	
Educational	20.2
Accounting/Financial	17.2
Medical	14.1
Entrepreneurial	12.5
Sales	7.8
Scientific/Technical	6.3
Homemaking	4.7
Other Areas	7.8
None (Student Only)	9.4

that is, those taxpayers who would have the sophistication and opportunity to make reporting choices involving ambiguous deductions.

Accuracy of Expectations Modelling

The first manipulation check compared the empirically derived expectations (reference points) to those furnished by the subjects in the debriefing process. This check was performed to assess the accuracy of the expectations modelling. If the models of expectations developed from the subsample predicted expectations accurately for all taxpayers in the study, then these empirical expectations should approximate the subjects' actual expectations of their 1995 tax liabilities and refund status amounts. To assess the similarity of these two sets of expectations, two regressions were performed. In the first, subject-reported liability expectations, LIABEXP, were regressed on their respective experimental liability benchmarks, LIABENCH. In the second, subject-reported refund status expectations, RSEXP, were regressed on their experimental refund status benchmarks, RSBENCH. Fifty-five observations were included for each analysis. The remaining nine of the 64 participants either left blank the spaces provided for furnishing expectations on the third questionnaire, stated that they had no idea what to expect, or expressed their responses in non-quantifiable terms such as "somewhat more than for 1994". For the 55 respondents to the expectations

inquiry, the mean liability expectation was \$9,324. The mean liability experimental benchmark was \$9,680. The analogous amounts for refund status were \$393 and \$396, respectively.

The results of the regression analyses of liability and refund status are presented in Table 4.2. Both models are highly significant ($p = .0001$) and their R^2 's are .9311 and .9038, respectively. Thus, the modelling procedures employed appeared to derive experimental benchmarks that were fairly close estimates of the post-experimental subject expectations for both measures.

Test for Holdout Sample Bias

Since twenty of the 64 subjects were required to state their 1995 liability and refund status expectations on the pre-experimental questionnaire, a demand effect may have altered these subjects' reported reactions to the 1995 estimates presented. Specifically, requesting expectations before presenting the task may have caused these subjects to use their stated expectations as their mental benchmarks, when otherwise they would have used different amounts or might have been unclear regarding their own expectations. The presence of a demand effect would be evidenced by stronger framing for the holdout group than for the remaining 44 subjects. This test, therefore, investigated for differences in framing between the two groups. If differences in framing were found, then the responses of the

Table 4.2
Tests of Accuracy of Expectations Modelling

Panel A: LIABEXP

R-Square = .9311

<u>Source</u>	<u>DF</u>	<u>SS</u>	<u>F</u>	<u>Pr > F</u>
Model	1	8343948578.4	715.859	.0001
Error	53	617759983.24		
Total	54	8961708561.6		
<u>Variable</u>	<u>DF</u>	<u>Parameter Est.</u>	<u>T</u>	<u>Pr > T</u>
INT	1	586.035716	1.038	.3039
LIABENCH	1	.902734	26.756	.0001

Panel B: RSEXP

R-Square = .9038

<u>Source</u>	<u>DF</u>	<u>SS</u>	<u>F</u>	<u>Pr > F</u>
Model	1	116638787.05	497.972	.0001
Error	53	12414054.294		
Total	54	129052841.35		
<u>Variable</u>	<u>DF</u>	<u>Parameter Est.</u>	<u>T</u>	<u>Pr > T</u>
INT	1	11.914948	.177	.8605
RSBENCH	1	.963033	22.315	.0001

20 participants in the holdout sample could not be included with those of the other 44 subjects in performing the hypothesis tests. In the absence of a demand effect, all 64 responses could be included, thus increasing the power of the tests.

A repeated measures analysis of variance was performed. The dependent measures were the subjects' initial and repeated reactions (frames). The independent class variables were change in liability (CHGLIAB), change in refund status (CHGRS), group (GRP = 1 for holdout sample and GRP = 0 otherwise), and all interactions of these independent variables. Significance of any interaction term containing the GRP variable would have indicated framing differences between the two groups. Significance resulted for the GRP/CHGLIAB interaction, which had a p-value of .0707. Since this meant that inclusion of the holdout sample in further analyses would have had a safety probability of about only seven percent, responses of these subjects were omitted from the remainder of the analyses. Forty-four observations were used in the following discussion and tests.

Elimination of Possibility of Order Effects

Subjects were requested on the second questionnaire (Appendix B) to rate their reactions to the hypothetical estimates and also to rate their inclinations to take ambiguous deductions. The order of presentation of these

two questions was randomly determined for obtaining these initial measures. Of the 44 participants remaining in this analysis, 17 were presented the reaction query before the inclination query (ORD = 1) and the remaining 27 received these questions in the reverse order (ORD = 2). This test was performed to afford assurance that responses to each question were unaffected by the order in which they appeared on the questionnaire.

Two analyses of variance were performed. The first one examined the effect of order on framing responses. Initial reaction (frame) was the dependent variable. Independent variables were CHGLIAB, CHGRS, ORD, and all possible interaction terms. Interaction significance involving ORD would have indicated that the order of the questions affected the framing responses. Resulting p-values for the CHGLIAB and CHGRS interactions with ORD were .8185 and .1051, respectively. The three-way interaction had a p-value of .2442. Thus, none of these terms reached significance at the $\alpha = .10$ level.

The second analysis examined the effect of order on the inclination (risk propensity) responses. The dependent variable used was the inclination to deduct at the five percent tax savings level, the first inclination question asked. Independent variables were initial frame reaction, order, and their interaction. The interaction term was not significant ($p = .2068$), indicating that analysis of

covariance was appropriate. In that analysis, ORD was not significant ($p = .2915$), thus assuring that the order of the questions did not affect responses to the risk question.

Summary of Initial Framing Results

Subjects in the gain-gain treatment group were expected to report initial gain frames (reaction ratings greater than four on the seven-point scale) when presented with lower tax liabilities and higher refund amounts or lower additional tax owed than the subjects' experimental reference points. Those in the loss-loss group were presented hypothetical liability and refund status amounts that represented unfavorable departures from the experimental reference points, and accordingly, were expected to report initial loss frames (reaction ratings less than four). Reported frames could not be anticipated for the two groups receiving crossed treatments, i.e., the gain-loss and loss-gain groups. Of the 44 subjects under consideration, 12 received the gain-gain treatment, 10 the loss-loss treatment, 11 the gain-loss treatment, and 11 the loss-gain treatment.

Table 4.3 summarizes the initial reactions of participants by treatment group. Of the 12 subjects in the gain-gain group, 10 reported gain reactions, one reported a loss reaction, and one reported a neutral reaction (rating of four on the seven-point scale). The mean rating for the gain-gain group was 5.25. A t-test that the gain-gain mean of 5.25 exceeded four resulted in a p-value of .01 and

Table 4.3
Summary of Initial Reactions (Frames)
by Treatment Group

<u>Treatment Group</u>	<u>Number of Subjects in Group</u>	<u>Mean Frame Rating</u>
GG	12	5.25
LL	10	2.50
GL	11	4.72
LG	11	5.18

<u>Treatment Group</u>	<u>Number Reporting Gain Frames</u>	<u>Number Reporting Loss Frames</u>	<u>Number Reporting Neutral Frames</u>
GG	10	1	1
LL	2	8	0
GL	4	4	3
LG	7	2	2

G = gain
L = loss

confirmed that the hypothetical return results presented successfully induced the intended perception of gain. The two subjects not experiencing gain reactions were in negative cash positions, that is, owed additional tax. It is possible that these subjects had the cash mentality described by Shadewald (1989) and that their negative cash position overrode the favorable changes in return measures. Eight of the 10 subjects in the loss-loss group reported loss reactions, two reported gain reactions, and none of them reported neutral reactions. Again, the majority of subjects confronted with amounts intended to be perceived as unfavorable changes actually reported loss reactions. The two deviating in their perceptions were in positive cash positions, that is, were receiving refunds. Again, Schadewald's (1989) mental orientation explanation could account for why these subjects viewed the estimates as favorable even though these estimates represented unfavorable changes from prior return results. The group had a mean response of 2.50. A t-test that the group mean of 2.50 was less than four resulted in a p-value of .01, thus indicating that these participants overall perceived a loss.

Four subjects in the gain-loss group reported gain reactions, four reported loss reactions, and three reported neutral reactions. The mean response for this group was 4.72. The loss-gain group responses favored gain reactions,

with 7 of the 11 subjects reporting gains. Two subjects reported loss reactions and two reported neutral reactions. This fourth group mean rating was 5.18. The prevalence of gain perceptions for this crossed treatment group suggests the dominance of the favorably manipulated refund status measure over the unfavorably manipulated liability measure.

Summary of Initial Frame/Risk Results

Subjects reporting loss reactions were expected to report higher inclinations to take ambiguous deductions than those reporting gain reactions. Table 4.4, Panel A, summarizes mean inclination ratings corresponding to initial loss, gain, and neutral reactions (frames) for both levels of tax savings. A t-test comparing the mean initial risk for gain frames to that of loss frames, i.e., 5.33 to 4.52, at the 5 percent tax savings level, resulted in a p-value of approximately .08. Taxpayers in loss frames were more inclined than taxpayers in gain frames to include the risky deductions at the 5 percent level of tax savings. Although the difference in means at the 20 percent tax savings was in the expected direction, no significant difference resulted. When the mean inclinations for both loss and gain frames were adjusted for the risk propensities corresponding to neutral framing, i.e., 3.50 and 3.67, prospect theory's predicted asymmetry over the two domains became readily apparent and the risk propensity (Panel B) corresponding to losses exceeded that of gains.

Table 4.4
Initial Frame/Risk Results

Panel A:

Character of Frame	<u>Mean Inclination to Deduct</u>	
	at 5%	at 20%
	<u>Tax Savings</u>	<u>Tax Savings</u>
Loss	5.33	6.13
Gain	4.52	6.00
Neutral	3.50	3.67

Panel B:

Character of Frame	<u>Neutral-Adjusted Inclination</u>	
	at 5%	at 20%
	<u>Tax Savings</u>	<u>Tax Savings</u>
Loss	1.83	2.46
Gain	1.02	2.33

Tests of Framing Hypotheses

This section presents the tests used to explore the hypothesized determinants of frame and the applicability of adaptation level theory to framing. Recall that the first two framing hypotheses concern the effects on taxpayer frame of (1) changes in tax liability and (2) changes in refund status. Specifically, increased tax liabilities were expected to induce loss frames while decreased liabilities were expected to induce gain frames. Decreased refunds or increased additional taxes owed were expected to induce loss frames; changes in the opposite directions were expected to induce gain frames. The third framing hypothesis is that frame intensity diminishes over time because adaptation is taking place. It was expected that repeated measures of taxpayers' frames would converge toward neutrality.

Tests of the framing hypotheses include the primary tests that employ only the hypothesized framing variables, i.e., change in tax liability, change in refund status, and time. Interactive effects of these variables are considered in the primary tests. Tests of competing framing hypotheses additionally examine the effect on framing of cash position (refund v. additional tax owed) that has been presumed to dominate framing in the predecessor studies reviewed in Chapter 2. Two potential framing factors, whether the taxpayer views taxes as pure losses and whether the taxpayer prefers a refund, are also examined.

Primary Framing Tests

A repeated measures analysis of variance was performed to test simultaneously all three framing hypotheses. Dependent variables were the initial reaction (FRAME1) and the repeated reaction measure (FRAME2). Independent class variables were change in liability (CHGLIAB) and change in refund status (CHGRS). They were coded +1 and -1 for favorable and unfavorable changes, respectively. It was expected that both variables would be statistically significant, thereby supporting the first two hypotheses. The CHGLIAB/CHGRS interaction was included in the model. The use of the two reaction measures as dependent variables captured the effect of time, the third independent classification variable. All possible interactions of these three classification variables were included in the model. The interaction of time (TIME) with the independent measures (CHGLIAB and/or CHGRS) was expected to be significant, thus indicating a change in frame intensity over time.

Table 4.5 presents the results of the overall tests for between- and within-subjects effects. Estimated cell means are presented in Table 4.6, Panel A. The higher their values, the more favorably the subjects perceived the estimates. Individual choices had been made on a seven-point scale. The results show that change in liability, change in refund status, and their interaction are significant. The estimated main effects of Table 4.6, Panel

Table 4.5

Overall Tests of Primary Framing Hypotheses

Panel A: Between-subjects Effects

<u>Source</u>	<u>DF</u>	<u>Type III SS</u>	<u>F</u>	<u>Pr > F</u>
CHGLIAB	1	20.4403998	4.38	.0430
CHGRS	1	69.7350057	14.93	.0004
CHGLIAB/CHGRS	1	15.9138061	3.41	.0724
ERROR	40	186.8636364		

Panel B: Within-subjects Effects

<u>Source</u>	<u>DF</u>	<u>Type III SS</u>	<u>F</u>	<u>Pr > F</u>
TIME	1	.04526594	.09	.7624
TIME/CHGLIAB	1	.18106375	.37	.5461
TIME/CHGRS	1	.04526594	.37	.5461
TIME/CHGLIAB /CHGRS	1	.04526594	.09	.7624
ERROR	40	19.54545455		

Note: P-values for the uni-directional simple effects tests (that are one-tailed t-tests) are one-half those of the F-tests reported here. Pr > t for CHGLIAB and CHGRS are .0215 and .0002, respectively.

Table 4.6
Estimates for Primary Framing Tests

Panel A: Estimated Cell Means

TIME 1		TIME 2	
GG 5.25	LG 5.18	GG 5.25	LG 5.09
GL 4.18	LL 2.50	GL 4.45	LL 2.50

Panel B: Estimated Main Effects

+1 CHGLIAB 4.78	-1 CHGLIAB 3.82
+1 CHGRS 5.19	-1 CHGRS 3.41
TIME 1 4.28	TIME 2 4.32

Panel C: Averages of Estimated Cell Means over Time
for (CHGLIAB, CHGRS)

(+1, +1)	5.25
(+1, -1)	4.32
(-1, +1)	5.14
(-1, -1)	2.50

B, support the directionality of the hypotheses concerning the main effects of CHGLIAB and CHGRS. Thus, there is initial support for the first two hypotheses. The main effect of time and the interactions of time with the other factors do not reach significance. Thus, the adaptation (third) hypothesis is not supported. Since the experimental design was primarily directed at examining the determinants of frame, it is possible that it was not sufficiently sensitive to detect adaptation, even if it were occurring.

The significance of the interaction of CHGLIAB with CHGRS suggests that these factors are not simply additive, but that in combination they affect framing. Table 4.6, Panel C, presents the averages of the estimated cell means over time. From these averages, the presence of the interaction is apparent. Frame ratings across favorable changes in liability (or refund status) do not parallel those across unfavorable changes in liability (or refund status). For example, the difference between the two levels of CHGLIAB for CHGRS = -1 ($1.82 = 4.32 - 2.50$) is more than sixteen times greater than that for CHGRS = +1 ($.11 = 5.25 - 5.14$).

To interpret the interaction, four additional repeated measures analyses of variance were performed, one for each change in liability classification (favorable or unfavorable) and one for each change in refund status classification (favorable or unfavorable). Dependent

variables were the same as for the primary framing tests but the interaction term was omitted from the independent variables. This term was no longer necessary because, in each analysis, one of the independent variables assumed only one classification level, rather than two as in the primary tests. Only those observations containing the level of interest for the restricted variable were included in each analysis.

The separate analyses of the effects of CHGRS on framing for unfavorable and for favorable CHGLIAB were qualitatively the same. In both cases, CHGRS was significant, having p-values of .0005 and .0306, respectively. Analogously, when CHGRS was unfavorable, CHGLIAB was significant ($p = .0028$). However, when CHGRS was favorable, CHGLIAB did not affect frame ($p = .4320$). This suggests that taxpayers factor both variables into framing except when their change in refund status is favorable, in which case, the favorable change in refund status subsumes even unfavorable liability changes. The dominance of a favorable change in refund status suggests that "additional" cash to be received (when a larger refund is due) or "saved" (if additional tax owed is less) in the present is far more salient than prepayments of any amount that may have contributed toward satisfying the tax liability. This interpretation concurs with the reasoning

advanced in prior research (e.g., Westat 1980 and Thaler 1985).

Tests of Competing Framing Hypotheses

The first competing hypothesis tested was the effect of cash position on framing. Recall, prior research almost unanimously used the break-even refund position as the presumed taxpayer reference point. Taxpayers were expected to frame refunds as gains and additional taxes owed as losses. Cash position, CASHPOS, was added to the primary framing model. CASHPOS was assigned a value of 1 when the taxpayer was in a refund position and a value of -1 when additional tax was owed. A comparison of the values of CASHPOS with those of both CHGLIAB and CHGRS suggests that CASHPOS is uncorrelated with either of these other two variables. The values of CASHPOS differ from those of CHGLIAB for 25 of the 44 observations and differ from those of CHGRS for 21 of the 44 observations. Of the 44 observations, 28 have CASHPOS = 1 and 16 have CASHPOS = -1.

The between-subjects results of including the CASHPOS variable are presented in Table 4.7. Within-subjects effects of TIME and its interactions did not reach significance at the $\alpha = .10$ level. The overall test for between-subjects effects shows that CHGLIAB, CHGRS, CASHPOS, and the CHGRS/CASHPOS interaction are significant. Further analysis of the CHGRS/CASHPOS interaction, performed analogously to the analysis of the CHGLIAB/CHGRS interaction

Table 4.7

Overall Tests of Competing Framing Hypotheses
Including CASHPOS in Model

Between-subjects Effects

<u>Source</u>	<u>DF</u>	<u>Type III SS</u>	<u>F</u>	<u>Pr > F</u>
CHGLIAB	1	39.3040338	12.70	.0012
CHGRS	1	34.0219825	10.99	.0032
CHGLIAB/CHGRS	1	.9789961	.32	.5774
CASHPOS	1	67.1961907	21.71	.0001
CHGLIAB/CASHPOS	1	1.2467186	.40	.5297
CHGRS/CASHPOS	1	10.5770353	3.42	.0728
CHGLIAB/CHGRS				
/CASHPOS	1	6.2610474	2.02	.1636
ERROR	36	111.4503968		

Note: P-values for the uni-directional simple effects tests (that are one-tailed t-tests) are one-half those of the F-tests reported here. Pr > t for CHGLIAB, CHGRS, and CASHPOS are .0006, .0016, and .0001/2, respectively.

in the primary framing test, shows that CHGLIAB and CASHPOS are highly significant. CHGRS is significant except when CASHPOS is negative.

It appears that CASHPOS does not compete with CHGLIAB and overrides CHGRS only when additional tax is owed. Overall, CASHPOS complements the hypothesized framing components. Together, these three factors explain over 50 percent of the variability in frame or about 20 percent more than was explained by the two hypothesized variables alone (not shown on tables). The importance of all three factors in framing suggests that taxpayers have dual perspectives (cash and accrual as explained by Schadewald 1989) regarding income taxes, and that cash position appears dominant. The explanation previously offered as to why two taxpayers in each of the gain-gain and loss-loss treatment groups failed to perceive the estimates as anticipated, i.e., that cash position was controlling, is supported by these results. The analysis including CASHPOS provides additional support for the first two framing hypotheses but still does not furnish evidence supporting the third, given that time does not interact with any of the independent variables in the model.

Further tests of competing hypotheses included in the progressive framing model whether taxpayers view taxes as pure losses (VIEW) and whether taxpayers prefer a refund (PREFREF). These factors had been investigated by Dusenbury

(1994) and neither had been found significant. Of the 44 taxpayers, 23 viewed taxes as pure losses and 35 indicated that they preferred a refund. Evidently, 23 (about one-half) of the subjects were dissatisfied with the services they receive for their tax dollars since they viewed taxes as pure losses. The majority, as might have been expected, preferred a refund. However, nine subjects did not indicate such a preference, and accordingly, might represent the more sophisticated taxpayers who prefer to defer the payment of taxes as long as possible to realize the time value of these dollars. As in Dusenbury (1994), no significance resulted for either VIEW or PREFREF.

Tests of Risk Attitude Hypothesis

Risk propensity is hypothesized to be greater for taxpayers in loss frames than for those in gain frames. The primary tests of this hypothesis are regression analyses that also include subject-specific risk measures, Jackson's (1994) and Kim's (1992), for which data were obtained on the third questionnaire. The former is an assessment of "physical, monetary, social, and ethical risk taking," with monetary risk taking weighed somewhat more heavily than the others (Jackson 1994). Responses to the 20 questions from the Jackson instrument (posed on the third questionnaire) were scored for each subject according to the instructions accompanying the Jackson Personality Inventory (Jackson 1994) and equated to a population percentile. Percentiles

were then converted to a seven-point scale for consistency with the other metrics in this study. The Kim risk measure reflects the subject's propensity to enter a monetary gamble. This measure was reported by subjects as a single response on a seven-point scale. Both the Jackson and the Kim risk measures were considered here because each of them has been found to affect individual choices under uncertainty. Kim (1992) used the monetary gamble and found that this specific risk measure, besides frame, influenced the riskiness of the choices the subjects made. Collins, Milliron and Toy (1992) found social and ethical risk propensities significant in tax evasion decisions. Although that study did not use the Jackson measure, the Jackson index includes the social and ethical dimensions of risk in addition to the monetary assessment of Kim's measure.

Further tests include a number of factors that have at times been found to affect risk attitude and that, for the most part, were briefly discussed in Chapter 1. These include taxpayer age, gender, educational level, adjusted gross income, familiarity with tax law that specifically affects the taxpayer's own return, familiarity with tax law overall, perception of peer compliance, fear of audit, fear of sanctions, whether the taxpayer self-prepares the return, and whether the taxpayer searches for all possible deductions.

Primary Risk Attitude Tests

Two primary regression analyses were performed examining the effect of subject reactions to the hypothetical tax return estimates (frames) on subjects' inclinations to include ambiguous deductions on their returns (risk attitudes). The first analysis includes measures from the first trial and the second, the repeated measures. Within each trial, two measures of inclination had been collected, one for each of two levels of tax savings. For each analysis, observations having neutral frames (reaction ratings of 4) were omitted since neutral frames are not contemplated by the hypothesis under investigation and their inclusion might have introduced noise and occluded the relationship of interest. This resulted in the inclusion of 38 observations for each analysis, although the same 38 were not used in both regressions since subject ratings of their reactions did not and had not been expected to remain constant across trials. Since the Jackson and Kim subject-specific risk measures were correlated (Pearson coefficient of .41523 and p-value of .0006), both regressions were performed including separately the two risk measures, making a total of four primary regressions.

The first regression analysis examined the effects of frame (FRAME1), the Jackson risk assessment (JSPRISK), and their interactions (FRAME1/JSPRISK) on subjects' initial

inclinations (risk attitudes) across levels of tax savings. Between- and within-subjects effects are presented in Table 4.8. FRAME1 and the FRAME1/JSPRISK interaction are significant. Further analysis of the interaction showed that frame was significant when taxpayers' individual risk propensities were averse, that is, when the Jackson index was less than neutral, but had no effect for individually risk-prone subjects with above-neutral Jackson indexes. When FRAME1 was significant, the sign of the FRAME1 coefficient was negative, indicating that the lower the reaction rating (the more unfavorable the frame), the higher the inclination to assume risk and take the ambiguous deductions. This concurs with the risk predictions of prospect theory and supports the frame/risk hypothesis. The within-subjects effects of SAVINGS/JSPRISK and SAVINGS/FRAME1/JSPRISK are also significant. Examining the directionality of the data discloses a direct relationship between level of tax savings and risk propensity.

Similarly, the second regression examined the effects of the repeated reaction measure (FRAME2), JSPRISK, and FRAME2/JSPRISK on the subjects' repeated inclinations (risk attitudes) across levels of tax savings. In this analysis, no between- nor within-subjects effects reached significance at the $\alpha = .10$ level.

The third and fourth regressions were repeats of the first two, but substituted the Kim risk measure for the

Table 4.8

Overall Tests of Primary Risk Attitude Hypotheses
for Initial Measures

Panel A: Between-subjects Effects

<u>Source</u>	<u>DF</u>	<u>Type III SS</u>	<u>F</u>	<u>Pr > F</u>
FRAME1	1	20.84353764	5.33	.0272
JSPRISK	1	7.37590424	1.89	.1786
FRAME1/JSPRISK	1	19.13477569	4.89	.0338
ERROR	34	132.96402878		

Panel B: Within-subjects Effects

<u>Source</u>	<u>DF</u>	<u>Type III SS</u>	<u>F</u>	<u>Pr > F</u>
SAVINGS	1	4.52257261	9.03	.0050
SAVINGS/FRAME1	1	.61970299	1.24	.2737
SAVINGS/JSPRISK	1	2.93926438	5.87	.0209
SAVINGS/FRAME1				
/JSPRISK	1	2.24991955	4.49	.0414
ERROR	34	17.02277992		

Jackson index. No significance resulted at the $\alpha = .10$ level for any between- or within-subjects effect in either analysis.

The results of these tests may be summarized as follows:

(1) Frame affects risk attitude as predicted by prospect theory and the frame/risk hypothesis when taxpayers are inherently risk-averse. The effect, however, is temporary; it was detected for the initial trial but not for the repeated trial.

(2) Tax compliance decisions entail multiple risk dimensions, rather than simply the inclination to enter a monetary gamble. The use of the Jackson index enabled the detection of the frame/risk relationship but the use of the Kim metric did not.

(3) Taxpayers assume greater risk when the potential tax savings are greater. This conclusion is derived from the significance of the within-subjects factors in the first regression.

Result (1) supports the fourth (frame/risk) hypothesis. It also suggests that, although frame intensity was not found to diminish in the framing tests, the effect of frame intensity on risk attitude *did diminish* over time. Result (2) concurs with Collins, Milliron and Toy (1992) that found that ethical and social risk concerns affected tax

compliance decisions. Result (3) agrees with intuition and is a by-product of the tests performed here.

Tests of Competing Risk Attitude Hypotheses

The 44 observations were included in tests introducing eleven additional, potential risk attitude factors, most of which have previously been hypothesized to affect taxpayer reporting risk and all of which were collected by the third questionnaire. These additional variables are the following:

AGE = Taxpayer's age in years. Values for the age variable range from 19 to 65 years and have a mean of 37 years.

GEN = Taxpayer's gender; 1 = male, 0 = female. This sample is comprised of 18 males and 26 females.

EDU = Taxpayer's highest completed educational level; 1 = high school, 2 = baccalaureate, 3 = advanced degree(s). There are 12 one's, 14 two's, and 18 three's in the sample.

AGI = Taxpayer's 1994 adjusted gross income. AGI's ranged from zero to \$160,419. Participants had a mean adjusted gross income of \$57,156.

SPLAW = Taxpayer's rating of familiarity with specific tax law provisions that affect him/her. Ratings range from one to seven on a seven-point scale. The mean rating for SPLAW is 4.2.

GNLAW = Taxpayer's rating of familiarity with general tax law. These ratings also range from one to seven and have a mean of 3.9.

PEER = 1 if taxpayer perceives peers as noncompliant with tax laws and 0 otherwise. Over 80 percent of participants believe peers are noncompliant.

AUD = 1 if taxpayer fears a tax audit of his/her return and 0 otherwise. About 44 percent of participants reported this concern.

SANC = 1 if taxpayer fears sanctions and 0 otherwise. About 30 percent of participants reported this concern.

SELF = 1 if taxpayer prepares own tax return and 0 otherwise. About 52 percent of participants prepare their own returns.

ALL = 1 if taxpayer searches for all possible deductions and 0 otherwise. Almost 80 percent of participants reported that they search for all deductions.

Four stepwise regressions were performed, regressing initial and repeated subject inclinations at both levels of tax savings on the independent variables used in the primary models plus the eleven additional variables described above. The resulting models included up to four factors: KSPRISK, SPLAW, SANC, and ALL. The latter three were from among the additional eleven variables and KSPRISK had been previously included in the primary tests.

Tests for competing risk attitude hypotheses used the primary risk attitude model containing the Jackson index expanded to include KSPRISK, SPLAW, SANC, and ALL, those factors identified by the Stepwise procedure. At $\alpha = .10$ for a one-tailed t-test, SANC, SPLAW, and ALL are significant for the initial trial and KSPRISK, SANC, and ALL are significant for the repeated trial. Frame is no longer significant. The differences resulting from the introduction of the additional variables are likely attributable to the duplication of information contained in both FRAME1 and the additional variables. Pursuing this explanation, FRAME1 was regressed on KSPRISK, SANC, SPLAW, and ALL. Both SANC and SPLAW were significant, thus supporting the possibility of information duplication. Additionally, a Pearson correlation analysis shows FRAME1 to be correlated with SANC, having a coefficient of .21 and a p-value of .09. Thus, frame and taxpayer perceptions of sanctions appear related and may explain the lack of significance of FRAME1 in the expanded model when Type III sums are used. Recall, Type III sums of squares reflect only the unique information contained in a variable and in this case, SANC may subsume FRAME1.

The results of the tests of competing risk attitude hypotheses show that the taxpayer's propensity to enter a monetary gamble, perceptions of sanctions, familiarity with specific tax provisions, and whether the taxpayer searches

for all possible deductions influence the risk taxpayers assume in making reporting choices. Perceptions of sanctions and familiarity with specific tax laws appear to compete with the informational content of taxpayer frame. These competing variables have been found influential in prior studies discussed in the first two chapters.

Direct Tests of Framing Component Effects on Risk Attitude

Support has been obtained for the first two framing hypotheses and the frame/risk relationship, the two tiers of the theoretical model of tax compliance developed in Chapter 3. If the relationships within each of the two tiers of the theoretical model are sufficiently strong, then the framing components identified in this study should relate directly to risk attitudes when the framing link is omitted. Direct tests of risk attitude versus framing components were performed to obtain additional assurance that it may be possible to curtail taxpayer aggressiveness by implementing policies that minimize "unfavorable" changes and statuses in tax return measures. The three independent variables used in these tests were CHGLIAB, CHGRS, and CASHPOS, those that were found to be significant components of taxpayer frame. For the first analysis, the dependent variables used were the initial (LRISK1) and repeated (LRISK2) inclinations at the low (5 percent) tax savings level. For the second, inclinations (HRISK1 and HRISK2) at the high (20 percent) tax savings level were the dependent measures. Both pairs

of dependent variables represented TIME across the experimental trials for each of the levels of tax savings.

Tests for between- and within-subjects effects for the first repeated measures analysis of variance (for low tax savings across trials) are presented in Tables 4.9 and 4.10, respectively. CHGLIAB is significant but no other between-subjects effect reaches significance at the $\alpha = .10$ level. An interesting observation emerges from the within-subjects tests. Despite the non-significance of TIME in the framing tests, here TIME interacted with CHGRS and with higher order interactions. This result concurs with the decreased effect of frame found over time in the frame/risk tests and again suggests that although frame intensity does not abate, its effects do. For the repeated measure of risk propensity at the low tax savings level, no factors reached significance at the $\alpha = .10$ level. Similar analyses for the high (20 percent) tax savings level resulted in no significant effects at the $\alpha = .10$ level.

These direct tests provide evidence that CHGLIAB and TIME do affect risk propensities, at least at low (5 percent) levels of tax savings. Since discretionary reporting options are likely to involve low levels of tax savings more often than higher tax savings, the results of this direct test appear relevant. The significance of TIME may be indirect evidence that adaptation was occurring but that it was not detected in testing the third framing

Table 4.9

Overall Direct Tests of Framing Component Effects
at the 5 Percent Tax Savings Level

Between-subjects Effects

<u>Source</u>	<u>DF</u>	<u>Type III SS</u>	<u>F</u>	<u>Pr > F</u>
CHGLIAB	1	11.8975077	2.14	.1522
CHGRS	1	.2172664	.04	.8444
CHGLIAB/CHGRS	1	.0347626	.01	.9374
CASHPOS	1	7.1720175	1.29	.2636
CHGLIAB/CASHPOS	1	.2172664	.04	.8444
CHGRS/CASHPOS	1	.6757883	.12	.7294
CHGLIAB/CHGRS /CASHPOS	1	3.8658335	.70	.4098
ERROR	36	200.1349206		

Note: P-values for the uni-directional simple effects tests (that are one-tailed t-tests) are one-half those of the F-tests reported here. Pr > t for CHGLIAB, CHGRS, and CASHPOS are .0761, .4222, and .1318, respectively.

Table 4.10

Overall Direct Tests of Framing Component Effects
at the 5 Percent Tax Savings Level

Within-subjects Effects

<u>Source</u>	<u>DF</u>	<u>Type III SS</u>	<u>F</u>	<u>Pr > F</u>
TIME	1	7.01402356	7.58	.0092
TIME/CHGLIAB	1	.20557710	.22	.6402
TIME/CHGRS	1	3.52382748	3.81	.0588
TIME/CHGLIAB				
/CHGRS	1	.30814121	.33	.5674
TIME/CASHPOS	1	.53740214	.58	.4509
TIME/CHGLIAB				
/CASHPOS	1	.62789988	.68	.4154
TIME/CHGRS				
/CASHPOS	1	4.91145946	5.31	.0271
TIME/CHGLIAB				
/CHGRS/CASHPOS	1	3.09245493	3.34	.0758
ERROR	36	33.30158730		

Note: The P-value for the uni-directional simple effects test (that is a one-tailed t-test) is one-half that of the F-test reported here. Pr > t for TIME is .0046.

hypothesis. However, whether or not adaptation explains the temporary nature of the frame/risk relationship, the presence of this phenomenon may find applicability in tax enforcement.

Summary

The results presented in this chapter are summarized in Table 4.11. Support has been obtained for the first two framing hypotheses, i.e., that changes in tax liability and changes in refund status affect taxpayer frame. These effects are in the hypothesized directions. The risk attitude hypothesis, that taxpayers in loss frames make reporting decisions that are more aggressive than those in gain frames, is also supported. The adaptation (third) framing hypothesis is not supported.

Favorable and unfavorable changes in refund status are significant determinants of gain and loss frames. Favorable and unfavorable changes in liability are significant except when the change in refund status is favorable. In this case, a favorable change in refund status overshadows even an unfavorable liability change.

Although no direct support was obtained to support the reduction in frame intensity over time, evidence that the effects of frame intensity diminish over time surfaced along with support for the frame/risk relationship. Frame, a significant determinant of risk attitude for risk-averse taxpayers for the initial trial, lost its significance in

Table 4.11
Summary of Results

Panel A: Results of Hypothesis Testing

Hypothesis	Results
H _{1a} : Favorable (unfavorable) changes in tax liabilities from prior tax liabilities induce gain (loss) taxpayer framing of the decision to file the current tax return.	Supported except when change in refund status is favorable.
H _{2a} : Favorable (unfavorable) changes in refund status amounts from prior refund status amounts induce gain (loss) taxpayer framing of the decision to file the current return.	Supported.
H _{3a} : The intensity of taxpayer frame diminishes over time.	Not supported.
H _{4a} : Taxpayers in loss frames are more likely to choose risky reporting alternatives than taxpayers in gain frames.	Supported for taxpayers who are risk-averse individuals.

Panel B: Other Significant Results

Cash position also affects taxpayer frame. Refunds due induce gain frames and additional taxes owed induce loss frames.

Although frame intensity does not diminish over time, its effects on reporting risk do diminish over time.

the repeated trial. These tests not only furnish support for the fourth (risk) hypothesis but indicate that even if adaptation does not explain the waning effect of frame, its effects on risk attitude dissolve over time.

Cash position appears to complement change in liability and change in refund status and appears to be the premier component of framing. Taxpayers in refund positions are "happier" with their results than those who owe additional tax. This result concurs with the reasoning upon which prior research was based.

Other variables found to be significant risk attitude determinants are taxpayers' perceptions of sanctions, their knowledge of specific tax provisions that affect their personal returns, and whether they search for all possible deductions. Studies briefly discussed in the first chapter found the first two of these influential and Dusenbury (1994) had tested the third but did not find that it was related to risk attitude. The loss of significance of frame when these variables are included in the tests suggests that frame may be capturing much of the information contained in these three.

A direct analysis of the effects of framing components on risk attitude showed that change in liability and time are significant at lower levels of tax savings. Over time, the effects of change in liability disappear. This result

again suggests that frame loses its effect on risk attitude after some time has passed.

CHAPTER 5

SUMMARY AND CONCLUSIONS

Introduction

This study was motivated by the enormous individual tax compliance gap that exists despite costly enforcement efforts targeted at narrowing the gap. It has sought additional insight into the origin of noncompliance, in order to suggest strategies that may reduce noncompliance incentives and complement the disincentive enforcement mechanism that is directed toward identifying and punishing taxpayers who have already made noncompliant decisions. A perceptual model of the noncompliance process has been developed and the model's framing and risk attitude tiers have been examined. Specifically, the study has investigated the effects of departures from prior return measures on taxpayer frame, and in turn, the effects of frame on the level of risk assumed in choosing between reporting alternatives.

In this chapter, summarized results of the framing and risk attitude tests are interpreted in the tax context. Implications for tax policy are discussed. Several limitations of the study are presented and implications for future research are explored.

Interpretation of Results

Results obtained in testing the framing and risk attitude hypotheses using the data obtained from the taxpayers participating in this experiment support the hypothesized

framing link between changes from prior tax return measures and tax reporting risk propensity. These results suggest that taxpayers with increased tax liabilities, smaller refunds, or larger amounts of additional tax owed at filing, compared to their prior years' amounts, would be more likely to frame these tax return results as losses and would be more apt to make riskier (less compliant) modifications to these tax returns. The initial strength of the relationships appear to diminish as time passes, because either frame intensity or its effect on risk propensity is some decreasing function of time. Thus, taxpayers who are apprised of their forthcoming return results well ahead of filing time are likely to have reduced reporting risk propensities.

Implications for Tax Policy

The results of this study may find tax enforcement application in the area of tax policy. Tax policy may be able to be formulated so as to minimize, with respect to frequency and extent, the occurrence of conditions that induce loss frames. To reduce dramatic increases in tax liabilities from year to year, perhaps income averaging provisions could be reintroduced. These might consider income and deductions and require the averaging of each over three or more years. Thus, increases in income and decreases in deductions would be smoothed and the loss framing potential for taxpayers, reduced. Although this approach, compared to current law, would defer collections of tax from taxpayers with escalating

liabilities, deferral would compare favorably with non-collection that too often emerges from loss frames.

The negative framing effects of refund status changes may be minimized through stiffened prepayment requirements. Subjecting all income to source withholding, without exemption, may be one approach. Requiring prepayments equal to 100 percent of the current year's estimated tax liability may be another. Larger prepayments would not only reduce unfavorable refund status changes and the negative framing effect at filing time but would also separate in time the taxpayer's realization of any increase in tax liability (learned upon prepayment) and the filing of the return (the time noncompliance decisions are made). Hence, the effects of any loss framing induced by increased prepayments should have at least partially waned by filing time. Requiring more frequent taxpayer accountability involving estimation of the current year's taxable income might also serve to minimize adverse taxpayer surprises at filing time. Implementation of these same prepayment policies may also reduce the number of taxpayers owing additional tax at filing time. Thus, the incidence of negative cash position, a factor found to complement the hypothesized framing variables in inducing loss frames, may also be reduced.

Remedial enforcement policy may be targeted at those taxpayers whose returns meet the conditions that induce loss frames and also exhibit latitude for taxpayer discretion in

reporting decisions. For instance, Form 1040 tax returns with accompanying Schedule B (itemized deductions), Schedule C (self-employment), or Schedule E (rents and royalties) would provide taxpayers the opportunity to include ambiguous deductions or to overstate actual deductions on these forms. Auditing the returns of such taxpayers may recover tax revenues more effectively than the present random audit process. This approach concurs with the IRS's soon-to-be-implemented strategy discussed in Chapter 1.

The major shortfall of using tax return measures as indexes of loss framing and noncompliance is that filed tax returns already incorporate the noncompliant modifications made by taxpayers. The unmodified, preliminary versions of the returns would reflect the attributes of interest but these are not observable by the IRS. Returns including larger modifications would be even less compliant than returns including smaller ones. Ironically, those returns containing the largest tax understatements may not appear suspect. For instance, tax returns containing taxpayer "adjustments" that result in a refund due, but without which additional tax would have been owed, would not appear to be conducive to loss framing and would be likely to escape scrutiny. Although remedial strategies based on the results of this study may have limited enforcement potential, the primary contribution of this study lies in the formulation of preventive tax enforcement strategies such as those discussed above.

Limitations

The participation criteria imposed precluded the sample's representativeness of taxpayers in general. Hence, the results may not generalize to all taxpayers. However, the subject screening criteria resulted in subjects that possessed more education, higher income levels, and more complex tax returns than taxpayers in general. Participants were more likely to have the latitude and sophistication to assume risky filing postures. The sample, therefore, was representative of the population of interest - potentially noncompliant taxpayers.

Subjects were faced with the decision to include an ambiguous deduction. This was a tax avoidance decision. There is no assurance that the results of the study generalize to decisions to engage in tax evasion. Evasion may evoke numerous additional ethical and social concerns that were not relevant here and that may contravene framing effects.

Requiring subjects to furnish copies of their prior years' Forms 1040 may have sensitized them to the measures of interest. Even though both pages of this form were collected to minimize such an effect, responses to the framing questions may have been based on prior amounts if participants had reviewed their prior returns immediately before furnishing them. However, in actuality the same influence may be present because taxpayers are likely to refer to prior tax returns in the course of preparing the current return.

Expectations collected in the debriefing process may have been influenced by the estimated amounts presented during the experiment. If such an effect were operating, then the tests for accuracy of expectations modelling may be inconclusive. Unbiased expectations may have differed from those reported.

Finally, there is the possibility that the experiment lacked realism for the subjects, despite the precautions taken to assure it. Subjects may not have reacted as intensely as they would have in actuality and/or their reported inclinations to include ambiguous deductions may not have corresponded to what they would have done in actuality. A lack of realism, however, would probably have diluted both reactions and inclinations and, accordingly, introduced an unfavorable bias. Despite this possibility, results have emerged.

Implications for Future Research

Further tax compliance research should be stimulated by the contributions of this study to the literature base, specifically, the identification of the framing components suggested by adaptation level theory. This study has made initial progress in explaining what tax return attributes cause taxpayers to frame their results as gains or losses. Further research may be able to model taxpayer framing more precisely.

The framing results may stimulate research in other disciplines as well. How individuals in non-tax contexts

frame choices may also be relative to their prior experiences. Thus, non-tax research in various disciplines may be stimulated to examine the applicability of adaptation level theory to framing.

The results of this study also suggest that the effects of framing on noncompliance are most pronounced initially and diminish rapidly. Thus, timing may also play an important role in reducing the level of noncompliance. Future research might examine the manner in which time dilutes risk propensity. It may be that frame intensity does diminish over time but in this study the frames reported in the repeated trial were not reflecting the taxpayers' actual reactions at that time. Experiments designed with the primary purpose of investigating the frame-intensity/time curve may be warranted. If reported frame intensity is unchanged by time, it may be interesting to attempt to disentangle the intellectual assessment of frame from the psychological reaction to it. Regardless why framing effects on risk attitude diminish, the timing of the decreasing effects invites further research. If it were known how long it takes for risk propensities to wane after taxpayers first learn the direction and size of changes in their tax return results, then reporting requirements might be imposed to inform taxpayers of changes soon enough to permit risk propensity to mellow before the return must be filed or the final payment made.

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APPENDIXES

APPENDIX A

Participant XXXXX:

The study in which you have agreed to participate will explore your reactions to the types of tax law changes currently being considered by Congress. There are no right or wrong answers to any of the questions you will be asked. Simply answer them as best you can.

The next time we meet, I will provide you with an **estimate** of your 1995 tax return results given that the tax law changes currently under consideration are passed. To improve the accuracy of my estimates, please complete the following questionnaire.

Circle either "yes" or "no" in response to the following questions. For each "yes" answer, please answer the next question in the blank space provided for this purpose. If you file jointly, please consider these questions with respect to both you and your spouse.

In 1995, do you expect to

- | | | |
|--|-----|----|
| 1. Add or lose dependents relative to 1994? | Yes | No |
| If yes, how many dependents will you claim for 1995? _____ | | |
| 2. Have a change in marital status? | Yes | No |
| If yes, to what status? _____ | | |
| 3. Begin new employment , end (quit or lose) your old job, or both (change jobs)? | Yes | No |
| If yes, what approximate 1995 income do you expect from all (old and/or new) employment? \$ _____ | | |
| 4. Begin a new business activity or discontinue an old one? | Yes | No |
| If yes, what approximate 1995 net income do you expect from all self-employment activities? \$ _____ | | |

Please describe any other major changes in your tax circumstances for 1995 that have not been mentioned above. These may include such things as sales of assets, receipt of tax deferred distributions, or anything that may cause a sizable change in your income or deductions. Estimate the effect of these items on your taxable income.

<u>Item</u>	<u>Dollar Estimate of Increase (Decrease) in Taxable Income</u>
<hr/>	<hr/>
<hr/>	<hr/>
<hr/>	<hr/>

Assuming there are no changes in tax law for the 1995 tax year, what approximate total tax liability do you expect to have for 1995? \$ _____

Definition: Your tax liability is the total income tax you owe on all your taxable income for the year, not just the amount you pay when you file your return. Part of this liability may be prepaid through payroll withholding or estimated tax payments you make during the year.

Assuming there are no changes in tax law for the 1995 tax year, approximately how much, if any, do you expect to pay when you file your return? \$ _____

Assuming there are no changes in tax law for the 1995 tax year, approximately how much, if any, do you expect to receive as a refund when you file your return? \$ _____

APPENDIX B

Participant XXXXX:

I have calculated preliminary estimates of your 1995 taxes based on the tax law changes now before Congress. There is, however, one aspect that needs additional confirmation. I will finalize these estimates later. For now, they reflect the information available to me.

Since our last meeting, have you thought of anything else that may affect your 1995 taxes? If so, please specify. _____

The following estimates are based on the information you provided previously:

1. Your total 1995 tax liability will be approximately \$XXXXX.

Remember, your tax liability is the total income tax you owe on all your taxable income for the year. You may be prepaying part of this liability through payroll withholding or by making estimated tax payments for 1995.

2. Your total 1995 refund will be approximately \$XXXX.

1. On the following 7-point rating scale below, please circle the number that best summarizes your reaction to the estimates presented on the preceding page. The scale ranges from one (very dissatisfied, upset, at a loss) to seven (very well satisfied, lucky, pleased).

1	2	3	4	5	6	7
Very			Neutral			Very well
dissatisfied						satisfied

2. Based on an analysis of the proposed changes, there appears to be an opportunity for some tax savings for some taxpayers. The wording of the proposals can be interpreted to allow an increase in certain Schedule (letter and title of either A, C, or E as applicable to the participant) deductions. The tax savings could be significant to you if you adopt this interpretation and take the additional deductions.

There is about a 50 percent chance that the IRS would interpret the law differently and that the deductions would be disallowed. If the interpretation is accepted by the IRS, you would end up reducing your total tax liability by about 5 percent. If the additional deductions are disallowed, you could end up paying the additional tax and interest and penalties amounting to about 50 percent of the additional tax.

On the 7-point scale below, please circle the number that rates your inclination to take these deductions. The scale ranges from one (I definitely would not take the deductions!) to seven (I'd definitely take the deductions!).

1	2	3	4	5	6	7
Definitely			Neutral			Definitely
would not						would
take deductions						take deductions

3. Suppose the additional deductions presented in the previous question would reduce your taxes by 20 percent instead of 5 percent. Now rate your inclination to take the deductions.

1	2	3	4	5	6	7
Definitely			Neutral			Definitely
would not						would
take deductions						take deductions

APPENDIX C

Participant XXXXX:

1. Since the last time we met, I have finalized your 1995 preliminary tax estimates and find that, based on the information you provided, there is no change from what was reported previously.

Your 1995 total tax liability will be approximately \$XXXX.

Your total 1995 refund will be approximately \$XXXX.

2. On the following 7-point rating scale below, please circle the number that best summarizes your reaction to the above estimates at this time. The scale ranges from one (very dissatisfied, upset, at a loss) to seven (very well satisfied, lucky, pleased).

1	2	3	4	5	6	7
Very			Neutral			Very well
dissatisfied						satisfied

3. The questionable deductions discussed last time are not reflected in the above estimates. Recall, if you choose to take these deductions, there is a 50 percent chance that they will be disallowed by the IRS. If the deductions are allowed, you would end up reducing your taxes by about 5 percent. If the deductions are not allowed, you could end up paying the additional tax and interest and penalties amounting to about 50 percent of the additional tax.

On the 7-point scale below, please circle the number that rates your inclination to take these deductions. This may or may not be similar to how you responded last time. The scale ranges from one (I definitely would not take the deductions!) to seven (I'd definitely take the deductions!).

1	2	3	4	5	6	7
Definitely			Neutral			Definitely
would not						would
take deductions						take deductions

4. Suppose the additional deductions presented in the previous question would reduce your taxes by 20 percent instead of 5 percent. Now rate your inclination to take the deductions.

1	2	3	4	5	6	7
Definitely			Neutral			Definitely
would not						would
take deductions						take deduct ons

5. Usually (circle one)
- (a) you or your spouse prepare your own tax return
 - (b) you pay a professional tax preparer or
 - (c) you have someone (friend, relative) prepare it for you as a favor?

6. Assuming there are no changes in tax law for the 1995 tax year, what approximate total tax liability do you expect to have for 1995? \$ _____

Assuming there are no changes in tax law for the 1995 tax year, approximately how much, if any, do you expect to owe and pay when you file your return? \$ _____

Assuming there are no changes in tax law for the 1995 tax year, approximately how much, if any, do you expect to receive as a refund when you file your return? \$ _____

7. For each of the following statements, circle "T" if you agree that the statement is a true description of you. If you disagree and feel the statement falsely describes you, then circle "F". Please circle one of the letters for each statement even if you are somewhat unsure:

- | | | | |
|----|--|---|---|
| a. | People have told me that I seem to enjoy taking chances. | T | F |
| b. | When I want something, I'll sometimes go out on a limb to get it. | T | F |
| c. | I consider security an important element in every aspect of my life. | T | F |
| d. | I rarely, if ever, take risks when there is another alternative. | T | F |
| e. | In games I usually "go for broke" rather than playing it safe. | T | F |
| f. | I try to avoid situations that have uncertain outcomes. | T | F |

- | | | | |
|----|--|---|---|
| g. | Taking risks does not bother me if the gains involved are high. | T | F |
| h. | I would prefer a stable position with a moderate salary to one with a higher salary but less security. | T | F |
| i. | The thought of investing in stocks excites me. | T | F |
| j. | I would participate only in business undertakings that are relatively certain. | T | F |
| k. | I would enjoy bluffing my way into an exclusive club or private party. | T | F |
| l. | If the possible reward was very high, I would not hesitate putting my money into a new business that could fail. | T | F |
| m. | I rarely even make small bets. | T | F |
| n. | If I invested any money in stocks, it would probably only be in safe stocks from large, well-known companies. | T | F |
| o. | I enjoy taking risks. | T | F |
| p. | When in school, I rarely took the chance of bluffing my way through an assignment. | T | F |
| q. | I would enjoy the challenge of a project that could mean either a promotion or loss of a job. | T | F |
| r. | Skin diving in the ocean would be much too dangerous for me. | T | F |
| s. | I think I would enjoy almost any type of gambling. | T | F |
| t. | I probably would not take the chance of borrowing money for a business deal even if it might be profitable. | T | F |
| u. | I think of income taxes as pure losses. | T | F |
| v. | I prefer a tax refund to an additional payment owed at filing time. | T | F |
| w. | I worry that my tax return will be audited. | T | F |

- x. I look for every possible tax deduction. T F
- y. I'd rather overpay than underpay my taxes because I worry what the IRS would do to me if they thought I was cheating. T F
- z. I think people often cheat on their taxes and get away with it. T F

8. Suppose you have a choice between playing a game in which you have a 50 percent chance of winning \$10 and a 50 percent chance of losing \$10 or not playing the game.

On the following scale that ranges from one (extremely unwilling to play) to seven (extremely willing to play), circle the number that best describes your willingness to play the game.

1	2	3	4	5	6	7
Extremely unwilling to play			Neutral			Extremely willing to play

9. Please provide the following information:

Age? _____

Gender? _____ (M or F)

Occupation? _____

The highest level of education that I have completed is
 high school _____
 baccalaureate degree _____
 master's degree _____
 doctorate _____

10. I would rate my familiarity with **overall** tax law on a scale of one (very unfamiliar) to seven (very familiar) as: (circle the appropriate rating below)

1	2	3	4	5	6	7
Very unfamiliar			Neutral			Very familiar

11. I would rate my familiarity with **specific** tax laws that affect me on a scale of one (very unfamiliar) to seven (very familiar) as: (circle the appropriate rating below)

1	2	3	4	5	6	7
Very unfamiliar			Neutral			Very familiar

Please detach this page to preserve the anonymity of your responses, sign it, and turn it in.

I realize that all information furnished, the potential tax savings presented, and the impact of proposed legislation on my 1995 tax status were purely hypothetical and do not constitute tax advice or filing recommendations. This study's purpose is primarily to learn about taxpayer responses to the types of tax law changes now pending.

Signed: _____

VITA

Phyllis V. Copeland, CPA, a native of New Orleans, Louisiana, received a bachelor of science in mathematics and a master of science in accounting (taxation) from the University of New Orleans. After numerous years combined professional experience in industry, public accounting, and academe, she entered the doctoral program at the Louisiana State University. Copeland completed the program in 1995, receiving a doctor of philosophy degree in accounting with a finance concentration and a minor in experimental statistics.

DOCTORAL EXAMINATION AND DISSERTATION REPORT

Candidate: Phyllis V. Copeland

Major Field: Accounting

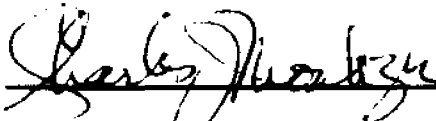
Title of Dissertation: The Effects of Departures From Prior Return Measures
on Individual Taxpayer Frame and Tax Reporting
Decisions

Approved:

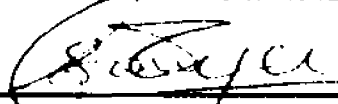

Major Professor and Chairman


Dean of the Graduate School

EXAMINING COMMITTEE:











Date of Examination:

October 25, 1995
